LEED 2009 FOR

DELAMAR

• WEST HARTFORD •

SBA
SMITH BUCKLEY ARCHITECTS
431 PINE ST STE 210 BURLINGTON VT 05401
P 802 540 0323 www.SBAVT.com

U.S. GREEN BUILDING COUNCIL LEED USGBC

LEED-NC v3.0 Preliminary Project Checklist

Delamar
West Hartford, CT

PROJECT STATUS:
DESIGN-DEVELOPMENT
10/1/2014

Yes	?	No			
22	**1**	**3**	**Sustainable Sites**		**26** Points
Y			Prereq 1	**Construction Activity Pollution Prevention**	Required
		1	Credit 1	**Site Selection**	1
5			Credit 2	**Development Density & Community Connectivity**	5
		1	Credit 3	**Brownfield Redevelopment**	1
6			Credit 4.1	**Alternative Transportation**, Public Transportation Access	6
1			Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
3			Credit 4.3	**Alternative Transportation**, Low-Emitting and Fuel-Efficient Vehicles	3
2			Credit 4.4	**Alternative Transportation**, Parking Capacity	2
		1	Credit 5.1	**Site Development,** Protect of Restore Habitat	1
1			Credit 5.2	**Site Development,** Maximize Open Space	1
1			Credit 6.1	**Stormwater Design,** Quantity Control	1
1			Credit 6.2	**Stormwater Design,** Quality Control	1
1			Credit 7.1	**Heat Island Effect,** Non-Roof	1
1			Credit 7.2	**Heat Island Effect,** Roof	1
	1		Credit 8	**Light Pollution Reduction**	1
	2	**8**	**Water Efficiency**		**10** Points
Y			Prereq 1	**Water Use Reduction,** 20% Reduction	Required
	2	2	Credit 1	**Water Efficient Landscaping**	2 to 4
		2	Credit 2	**Innovative Wastewater Technologies**	2
		4	Credit 3	**Water Use Reduction**	2 to 4
12	**8**	**15**	**Energy & Atmosphere**		**35** Points
Y			Prereq 1	**Fundamental Commissioning of the Building Energy Systems**	Required
Y			Prereq 2	**Minimum Energy Performance**	Required
Y			Prereq 3	**Fundamental Refrigerant Management**	Required
8	3	8	Credit 1	**Optimize Energy Performance**	1 to 19
1	1	5	Credit 2	**On-Site Renewable Energy**	1 to 7
	2		Credit 3	**Enhanced Commissioning**	2
2			Credit 4	**Enhanced Refrigerant Management**	2
1		2	Credit 5	**Measurement & Verification**	3
	2		Credit 6	**Green Power**	2
7		**7**	**Materials & Resources**		**14** Points
Y			Prereq 1	**Storage & Collection of Recyclables**	Required
		3	Credit 1.1	**Building Reuse**, Maintain Existing Walls, Floors & Roof	1 to 3
		1	Credit 1.2	**Building Reuse**, Maintain 50% of Interior Non-Structural Elements	1
2			Credit 2	**Construction Waste Management**	1 to 2
		2	Credit 3	**Materials Reuse**	1 to 2
2			Credit 4	**Recycled Content**	1 to 2
2			Credit 5	**Regional Materials**	1 to 2
		1	Credit 6	**Rapidly Renewable Materials**	1
1			Credit 7	**Certified Wood**	1

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PROJECT STATUS:
DESIGN-DEVELOPMENT
10/1/2014

Delamar
West Hartford, CT

Yes	?	No			
11		**4**	**Indoor Environmental Quality**		**15** Points
Y			Prereq 1	**Minimum IAQ Performance**	Required
Y			Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	Required
1			Credit 1	**Outdoor Air Delivery Monitoring**	1
		1	Credit 2	**Increased Ventilation**	1
1			Credit 3.1	**Construction IAQ Management Plan**, During Construction	1
1			Credit 3.2	**Construction IAQ Management Plan**, Before Occupancy	1
1			Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1
1			Credit 4.2	**Low-Emitting Materials**, Paints & Coatings	1
1			Credit 4.3	**Low-Emitting Materials**, Flooring Systems	1
1			Credit 4.4	**Low-Emitting Materials**, Composite Wood & Agrifiber Products	1
1			Credit 5	**Indoor Chemical & Pollutant Source Control**	1
1			Credit 6.1	**Controllability of Systems**, Lighting	1
1			Credit 6.2	**Controllability of Systems**, Thermal Comfort	1
		1	Credit 7.1	**Thermal Comfort**, Design	1
		1	Credit 7.2	**Thermal Comfort**, Verification	1
		1	Credit 8.1	**Daylight & Views**, Daylight 75% of Spaces	1
1			Credit 8.2	**Daylight & Views**, Views for 90% of Spaces	1
3	3		**Innovation & Design Process**		**6** Points
1			Credit 1.1	**Innovation in Design**: Education	1
	1		Credit 1.2	**Innovation in Design**: Green Cleaning	1
1			Credit 1.3	**Innovation in Design**: Walkable Site	1
	1		Credit 1.4	**Innovation in Design**: Active Occupants	1
	1		Credit 1.5	**Innovation in Design**: Exemplary Performance or Other	1
1			Credit 2	**LEED® Accredited Professional**	1
4			**Regional Priority**		**4** Points
1			Credit 1.1	**Regional Priority**: SSc7.2, Heat Island Effect, Roof	1
1			Credit 1.2	**Regional Priority**: SSc6.1, Stormwater Design, Quantity Control	1
1			Credit 1.3	**Regional Priority**: EAc2, On-Site Renewable Energy	1
1			Credit 1.4	**Regional Priority**: SSc7.1, Heat Island Effect, Non-Roof	1
59	14	**37**	**Project Totals** (pre-certification estimates)		**110** Points

Yes ? No **Certified** 40-49 points **Silver** 50-59 points **Gold** 60-79 points **Platinum** 80-110 points

Current LEED Checklist Status:

59 points as "Yes"
14 points as "Maybe."

This is a comfortable place to be at this point in the project. Gold requires 60 points minimum, but it is good to have a few points of cushion.

As the design and construction documentation process continues, we will identify the particular "maybe" credits achieved to attain the Gold level standard.

View from northwest corner of Memorial & Raymond

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View from west side of Raymond

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View from southwest on Raymond

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View from southeast corner of Event Lawn

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•WEST HARTFORD•

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LANGAN

SECTION 00 0110
TABLE OF CONTENTS

PROCUREMENT AND CONTRACTING REQUIREMENTS

Division 00 -- Procurement and Contracting Requirements

SPECIFICATIONS

Division 01 -- General Requirements

LEED- related general requirements

Division 02 -- Existing Conditions – Not Used

Division 03 -- Concrete

LEED- related specific requirements in most spec sections

Division 04 -- Masonry

SECTION 03 3000
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

B. Related Sections:
   1. Division 31 Section "Earth Moving" for fill under slabs-on-grade and foundations.

1.02 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement. Draw all walls and grade beams in elevation; coordinate and show MEP and Architectural penetrations. Show control and construction joints.

D. Welding certificates.

E. Material certificates.
   1. Cementitious materials.
   2. Admixtures.
   3. Form materials..
   4. Steel reinforcement and accessories.

F. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
   1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

G. Floor surface flatness and levelness measurements.

1.03 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
   1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

B. Testing Agency Qualifications: An independent agency qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."

D. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
   1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
   2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

E. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

F. Preinstallation Conference: Conduct conference at Project site.

1.04 LEED REQUIREMENTS AND SUBMITTALS

A. LEED Submittals: LEED submittals and requirements include those listed in Section 01 3515 LEED Certification Procedures. and the following specific to products in this Section.

B. LEED MR Credit 4. Recycled Content: Provide documentation of the percentage of postconsumer and preconsumer recycled content of each material supplied based on cost of the total material.

C. MR Credit 5. Regional Materials: Provide documentation for all materials in this section to indicate regional material content.

PART 2 - PRODUCTS

2.01 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Form Release Agent: Bio-based.

2.02 STEEL REINFORCEMENT

A. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 70 percent.

B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

C. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from as-drawn steel wire into flat sheets.

D. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice.

2.03 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
   1. Portland Cement: ASTM C 150, Type I, gray.
   2. Fly Ash: ASTM C 618, Class F.
   3. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

B. Normal-Weight Aggregates: ASTM C 33, graded.
   1. Maximum Coarse-Aggregate Size: In accordance with ACI 301 and 318.
   2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: ASTM C 94. Non-potable.

2.04 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

2.05 VAPOR RETARDERS

A. Sheet Vapor Retarder: Thickness of 15 mils. See Division 7 Spec Section.

2.06 CURING MATERIALS

A. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

B. Water: Non-potable meeting ASTM C 94..

2.07 SEALERS

A. Unless noted otherwise, provide Ashford Formula at all exposed slabs. Epoxy coated slabs are not exposed.

2.08 CONCRETE MIXTURES

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

B. Cementitious Materials:
1. Use fly ash pozzolan or ground granulated blast-furnace slag as needed to reduce the total amount of portland cement, which would otherwise be used by:
   a. 40 percent for perimeter foundation wall ftgs, individual and combined footings, including connective grade beams.
   b. 25 percent for perimeter foundation wall and beam elements with integral pilasters; site walls; pit walls; and pads
   c. 15 percent exterior, exposed slabs; and interior slabs-on-grade and slabs on metal deck.

C. Admixtures: Use admixtures according to manufacturer's written instructions.
1. Use water-reducing, high-range water-reducing, or plasticizing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use water-reducing admixture in pumped concrete, concrete for pavements and slabs on grade with a water-cementitious materials ratio below 0.50.

D. Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strengths
   a. 3000 psi for individual footings, grade beams, combined footings, perimeter foundation wall at 56 days
   b. 3500 psi for interior slabs–on-grade and toppings at 28 days
   c. 4000 psi for walls, pilasters below grade and beam elements at 56 days.
   d. 4500 psi exterior, exposed site walls at 28 days
   e. 5000 psi for exterior pavements and piers at 28 days
2. Maximum Water-Cementitious Materials Ratio: In accordance with ACI 318 & 211 and:
   a. Maximum for slabs to receive moisture sensitive flooring is 0.50
   b. Maximum for exterior pavements and piers is 0.40

LEED PRODUCT SUBMITTAL SHEET
LEED 2009 FOR NEW CONSTRUCTION AND MAJOR RENOVATIONS

Product:	Date:
Specification Section:	Material Cost:
Quantity:	Unit of Measure:

Return this form, along with required attachments for each product as required by the Project Manual. Verify specific product requirements in each specification section.

Subcontractor/ Installer	Company:	
	Contact Name:	
	Address:	
	Telephone:	Email:
Product Manufacturer/ Vendor	Company:	
	Contact Name:	
	Address:	
	Telephone:	Email:

☐ **RECYCLED CONTENT:** Percentages by weight.

% Virgin Content:	% Pre-Consumer Content:	% Post-Consumer Content:	Total: 100%

Provide manufacturer's documentation indicating recycled content.

☐ **LOCAL / REGIONAL MATERIALS:**

Is product manufactured and extracted within 500 miles of project site?	Distance in miles from location of manufacture to job site:	Distance in miles from location of extraction, harvest or salvage to job site:

Provide manufacturer's documentation indicating location of manufacture and extraction. If only a portion of the product qualifies, indicate percentage by weight.

☐ **RAPIDLY RENEWABLE MATERIALS:** Typically harvested in a 10-year or shorter cycle.

Is product made from a rapidly renewable material?	% rapidly renewable by weight:

Provide manufacturer's documentation indicating rapidly renewable content.

☐ **CERTIFIED WOOD:** Forest Stewardship Council Certification.

Is all or part of the product made from wood-based materials?	% wood-based by weight:	Is product FSC certified?

Provide Chain-of-Custody number for vendor; indicate on invoice FSC certified items and type of certification for each.

LOW-EMITTING MATERIALS: Provide documentation indicating compliance with applicable requirements.

☐ **ADHESIVES AND SEALANTS:** Comply with South Coast Air Quality Management District (SCAQMD) Rule #1168.

Indicate VOC Content in grams per liter: _____

☐ **PAINTS AND COATINGS:** Architectural paints and coatings comply with Green Seal Standard GS-11. Anti-corrosive and anti-rust paints comply with Green Seal Standard GC-03. Clear wood finishes, floor coatings, etc., comply with South Coast Air Quality Management District (SCAQMD) Rule #1113.

Indicate VOC Content in grams per liter: _____

FLOORING SYSTEMS:

☐ Carpet is Carpet and Rug Institute Green Label Plus Certified.

☐ Carpet cushion is Carpet and Rug Institute Green Label Certified.

☐ Carpet adhesive complies with requirements for adhesives and sealants.

Indicate VOC Content in grams per liter: _____

☐ Hard surface flooring is FloorScore certified.

☐ Concrete, wood, bamboo and cork finishes comply with SCAQMD Rule #1113.

Indicate VOC Content in grams per liter: _____

☐ Settings and adhesives comply with SCAQMD Rule #1168.

Indicate VOC Content in grams per liter: _____

☐ **COMPOSITE WOOD AND AGRIFIBER PRODUCTS:** Products and adhesives contain no added urea-formaldehyde.

CONSTRUCTION

193 Tilley Drive
South Burlington, VT 05403
T: 802-658-4100
F: 802.419.5024
E:

Project No. 13341
Hotel Vermont
41 Cherry St.
Burlington, VT 05401

Submittal 088000.002
Review Cycle 1

Title	**Glazing Type IG1 and IG2 Product Data**	Spec Section	**088000**
Type	**Product Data**	Spec Sub-Section	
Sent Date	**15-May-2012**		
Due Date	**30-May-2012**		

Sent To For Review
Louis Kraft
Smith Buckley Architects

Responsible Subcontractor / Vendor
Greg Swan
St Albans Glass Company, Inc.

Item Being Submitted
Glazing Type IG1 and IG2 Product Data

Please see that attached sheets for the product data on glazing types IG1 and IG2.

Note: In submittal 08000.001, the glazing color was identified as 1/4" PPG Solarban® 60 on Clear Low-E #2. Also noted in this submittal was that glazing types IG1 and IG2 were going to be submitted as the same product.

Contractor's Review Stamp

I hereby certify that I have examined the enclosed submittal(s) and have determined and verified all field measurements, construction criteria, materials, catalog numbers, and similar data, coordinated the submittal(s) with other submissions and the work of other trades and contractors and, to the best of my knowledge and belief, the enclosed submittal(s) is/are in full compliance with the Contract requirements, except as noted above.

Signature Date

Name
Brendan Flood
PC Construction Company

This approval does not release subcontractor / vendor from the contractual responsibilities.

Architect's Review Stamp

- [x] REVIEWED
- [ ] MAKE CORRECTIONS NOTED
- [ ] REVISE AND RESUBMIT
- [ ] REJECTED

project # 08109
submittal # 2
spec div. 08 8000

THIS REVIEW IS FOR THE LIMITED PURPOSE OF CHECKING FOR CONFORMANCE WITH THE DESIGN CONCEPT FOR THE PROJECT AND COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND COORDINATING ALL DIMENSIONS AND EXISTING CONDITIONS; FOR INFORMATION THAT PERTAINS SOLELY TO FABRICATION PROCEDURES, OR TO MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES OF CONSTRUCTION; AND FOR COORDINATION OF THE WORK WITH OTHER TRADES.

SMITH BUCKLEY ARCHITECTS, PLLC
431 PINE ST., STE 210, BURLINGTON VT 05401
802-540-0323

REV. BY 05/15/2012

LEED PRODUCT SUBMITTAL SHEET
LEED 2009 FOR NEW CONSTRUCTION AND MAJOR RENOVATIONS

Product: GLASS	Date: 4-3-12
Specification Section: 088000	Material Cost: 78,000
Quantity: 4,300	Unit of Measure: S.F.

Return this form, along with required attachments for each product as required by the Project Manual. Verify specific product requirements in each specification section.

Subcontractor/ Installer	Company: ST. ALBANS GLASS CO. INC	
	Contact Name: GREG SWAN	
	Address: 19 BEAUREGARD DR, ST. ALBANS, VT	
	Telephone: 802-524-6629	Email: gregestalbansglass.com
Product Manufacturer/ Vendor	Company: OLDCASTLE BUILDING PRODUCTS	
	Contact Name:	
	Address: MONTREAL, QB, CANADA	
	Telephone:	Email:

☒ **RECYCLED CONTENT:** Percentages by weight. SEE ATTACHED

% Virgin Content:	% Pre-Consumer Content:	% Post-Consumer Content:	Total: 100%

Provide manufacturer's documentation indicating recycled content.

☒ **LOCAL / REGIONAL MATERIALS:**

Is product manufactured and extracted within 500 miles of project site?	Distance in miles from location of manufacture to job site:	Distance in miles from location of extraction, harvest or salvage to job site:
YES	72	446

Provide manufacturer's documentation indicating location of manufacture and extraction. If only a portion of the product qualifies, indicate percentage by weight.

☐ **RAPIDLY RENEWABLE MATERIALS:** Typically harvested in a 10-year or shorter cycle.

Is product made from a rapidly renewable material?	% rapidly renewable by weight:

Provide manufacturer's documentation indicating rapidly renewable content.

☐ **CERTIFIED WOOD:** Forest Stewardship Council Certification.

Is all or part of the product made from wood-based materials?	% wood-based by weight:	Is product FSC certified?

Provide Chain-of-Custody number for vendor; indicate on invoice FSC certified items and type of certification for each.

LOW-EMITTING MATERIALS: Provide documentation indicating compliance with applicable requirements.

☑ **ADHESIVES AND SEALANTS:** Comply with South Coast Air Quality Management District (SCAQMD) Rule #1168.

Indicate VOC Content in grams per liter: 27g/L

☐ **PAINTS AND COATINGS:** Architectural paints and coatings comply with Green Seal Standard GS-11. Anti-corrosive and anti-rust paints comply with Green Seal Standard GC-03. Clear wood finishes, floor coatings, etc., comply with South Coast Air Quality Management District (SCAQMD) Rule #1113.

Indicate VOC Content in grams per liter: _____

FLOORING SYSTEMS:

☐ Carpet is Carpet and Rug Institute Green Label Plus Certified.

☐ Carpet cushion is Carpet and Rug Institute Green Label Certified.

☐ Carpet adhesive complies with requirements for adhesives and sealants.

Indicate VOC Content in grams per liter: _____

☐ Hard surface flooring is FloorScore certified.

☐ Concrete, wood, bamboo and cork finishes comply with SCAQMD Rule #1113.

Indicate VOC Content in grams per liter: _____

☐ Settings and adhesives comply with SCAQMD Rule #1168.

Indicate VOC Content in grams per liter: _____

☐ **COMPOSITE WOOD AND AGRIFIBER PRODUCTS:** Products and adhesives contain no added urea-formaldehyde.

Oldcastle BuildingEnvelope

April 3, 2012

St. Albans Glass Company, Inc.
19 Beauregard Drive
St. Albans, VT 05478

Reference:	LEED® Documents per USGBC v3.0 Guidelines
Project Name:	Hotel VT
Location:	41 Cherry Street, Burlington, VT 05401
Products:	Oldcastle BuildingEnvelope™ 1" Clear Low-e Insulating Glass Units (ANN/ANN)
	Oldcastle BuildingEnvelope™ 1" Clear Low-e Insulating Glass Units (HS/ANN)
	Oldcastle BuildingEnvelope™ 1" Clear Low-e Insulating Glass Units (TP/TP)
	Oldcastle BuildingEnvelope™ 1" Clear Spandrel Insulating Glass Units

Enclosed are the LEED® documents requested for the above referenced project.

Energy and Atmosphere Credit 1: Optimize Energy Performance:
All building components must meet the minimum insulation and maximum U-factor and SHGC requirements listed for the project's climate zone. Oldcastle BusinessEnvelope™ provides high-performance glass products that can contribute to this category.

Indoor Environmental Quality Credit 4.1 & 4.2: Low Emitting Materials:
Oldcastle BuildingEnvelope™ insulating glass units are not a source emission of Volatile Organic Compounds (VOC's). Oldcastle BuildingEnvelope™ provides compounds that do not contribute to environmental damage.

Indoor Environmental Quality Credit 8.1 & 8.2: Daylight and Views:
Oldcastle BusinessEnvelope™ provides products that allow the use of natural daylighting.

Materials and Resources Credit 4.1 Recycled Content: 10% (post-consumer + ½ pre-consumer)
Materials and Resources Credit 4.2 Recycled Content: 20% (post-consumer + ½ pre-consumer)
The LEED® requirements preclude float glass suppliers from giving credit for recycled glass that is reclaimed within the same process that generated it. Oldcastle BuildingEnvelope™ can provide up to 0.63% post-consumer and 0.75% pre-consumer recycled content based on aluminum spacer being used in insulating glass units.

Materials and Resources Credit 5.1 & 5.2: Regional Materials:
Oldcastle BusinessEnvelope™ does fabricate product within 500 miles of the project site. Oldcastle BusinessEnvelope™ does fabricate product from components that are extracted within 500 miles of the project site. See the enclosed LEED® Documentation Sheet.

Should you require further assistance, please contact me at the Technical Services Department for Oldcastle BusinessEnvelope™.

Sincerely,

Matt Manning
Technical Services Manager
Oldcastle BuildingEnvelope™

Materials Credits Documentation Sheet

LEED® - Green Building Rating System

MATERIAL OR PRODUCT: Insulating Glass Units; Spandrel Insulating Glass Units	
MATERIAL COST (LESS LABOR AND EQUIPMENT):	
Glazier/Installer: St. Albans Glass Company, Inc.	Manufacturer: Oldcastle BuildingEnvelope™ (Fabricator to jobsite)
Glazier Address: 19 Beauregard Drive St. Albans, VT 05478	Manufacturer/Fabricator Address: 12755 Boul. Industriel Montreal, Quebec H1A 4Z6
Project: Hotel VT / 41 Cherry Street, Burlington, VT 05401	
Contact: Greg Swan	Contact: Jason Meuse

Signed by: _____ Date: 04/03/12 Company: Oldcastle BuildingEnvelope™

Glass Types: (Detailed explanation of glass types)
Type-1: 1" o.a. Clear Low-E Insulating Glass Unit (ANN/ANN):
1/4" PPG Solarban 60 on Clear Low-E #2 - 1/2" Airspace - 1/4" PPG Clear

Type-2: 1" o.a. Clear Low-E Insulating Glass Unit (HS/ANN):
1/4" PPG Solarban 60 on Clear Low-E #2 - 1/2" Airspace - 1/4" PPG Clear

Type-3: 1" o.a. Clear Low-E Insulating Glass Unit (TP/TP):
1/4" PPG Solarban 60 on Clear Low-E #2 - 1/2" Airspace - 1/4" PPG Clear

MR Credit 4.1 - Recycled Content
Does the material/product contain post-consumer or pre-consumer content?

Percentage of post-consumer (PC) content?	**0.63%**	(Aluminum Spacer)
Percentage of pre-consumer (PE) content?	**0.75%**	(Aluminum Spacer)

Assembly Components:	Weight (lbs):	%PC	%PE
Type-1: 1" Clear Low-E Insulating Glass Unit (ANN/ANN)	**5.88 lb/sqft**		
1/4" PPG Clear Glass (substrate for Solarban 60 Low-E)	2.89 lb/sqft	N/A	0%
1/4" PPG Clear Glass	2.89 lb/sqft	N/A	0%
Aluminum Allmetal Spacer (37% PC, 44% PE recycled content)	0.10 lb/sqft	0.63%	0.75%
Type-2: 1" Clear Low-E Insulating Glass Unit (HS/ANN)	**5.88 lb/sqft**		
1/4" PPG Clear Glass (substrate for Solarban 60 Low-E)	2.89 lb/sqft	N/A	0%
1/4" PPG Clear Glass	2.89 lb/sqft	N/A	0%
Aluminum Allmetal Spacer (37% PC, 44% PE recycled content)	0.10 lb/sqft	0.63%	0.75%
Type-3: 1" Clear Low-E Insulating Glass Unit (TP/TP)	**5.88 lb/sqft**		
1/4" PPG Clear Glass (substrate for Solarban 60 Low-E)	2.89 lb/sqft	N/A	0%
1/4" PPG Clear Glass	2.89 lb/sqft	N/A	0%
Aluminum Allmetal Spacer (37% PC, 44% PE recycled content)	0.10 lb/sqft	0.63%	0.75%
Totals (Weight should = 100% of assembly):			

* Assembly Recycled Content = [Component Weight (lbs) x Recycled Content (%) / Total Weight (lbs)] x 100%
N/A = Not Applicable

MR Credit 5.1 - Locally Manufactured Materials/Product

Was the material/product manufactured or fabricated locally within 500 Miles of the job site?

Location of manufacturer/fabricator (City/State)	Oldcastle BuildingEnvelope™, Montreal, Quebec
Miles to manufacturer/fabricator from the job site:	**72 Miles**

MR Credit 5.2 - Locally Harvested Materials

Does the product/material contain locally harvested raw materials within 500 Miles of the job site?

Raw Materials:	City/State	Miles
Sand 73% by weight PPG 1/4" Clear Glass (substrate for Solarban 60 Low-E)	**Gore, VA**	**446**
Sand 73% by weight PPG 1/4" Clear Glass	**Gore, VA**	**446**

EQ Credit 4.1 – Low-Emitting materials – Adhesives & Sealants

Does the product/material meet emission factor limits of SCAQMD or BAAQM?

Product Name:	CRI- ID# if applicable	VOC Content (g/L)
GE/Momentive 3723 Silicone Secondary Edge Sealant	N/A	**27 g/L**

PPG Industries

PPG Industries, Inc.
Guys Run Road
Post Office Box 38361
Pittsburgh PA 15238-8361 USA
Telephone (412) 820-8148
Fax (412) 826-2299
bitterice@ppg.com

Michael G. Bitterice
Sr. Engineer, Technical Services
Flat Glass Products

October 2007

Oldcastle BuildingEnvelope™
2745 Dallas Parkway, Suite 560
Plano, TX 75093

Subject: LEED Documentation

I am responding to your request to Rick Hagerman that the information provided in two previous letters from PPG be summarized into one letter.

In an effort to help, I offer the following:

The following table summarizes the location and distance of the sand supplied to the various PPG float glass production facilities.

Sand Shipments to PPG Float Glass Production Facilities

PPG PRODUCTION FACILITY	SAND SOURCE	
	FOB LOCATION	FOB DISTANCE (miles)
Wichita Falls	Mill Creek, OK	129
	Roff, OK	135
Carlisle	Berkeley Springs, WV	82
	Gore, VA	102
Meadville	Chardon, OH	60
Mt. Zion	Utica, IL	122
	Wedron, IL	141
Fresno, CA	Ione, CA	153
	Byron, CA	134
Owen Sound, ON Canada	Midland, ON	80

I trust that this satisfies your need. Contact either Rick Hagerman or me if you have any questions.

Very truly yours,

Michael G. Bitterice

Cc: J. W. Bissey
P. W. Bush
R. C. Hagerman
M. L. Rupert

ALLMETAL®

ALLMETAL, INC.
Since 1915
CORPORATE HEADQUARTERS
P.O. BOX 850 • BENSENVILLE, IL 60106
(630) 250-8090 • 800-638-2599
FAX: (630) 250-8387

July 21, 2010

Jean Thomas
Company: Oldcastle Building Envelope
Address: 1273 N. Church Street, Unit 100A
City: Moorestown.
State: NJ
Country: USA
Zip Code: 08057

Dear Jean Thomas,

We confirm that the aluminum spacer and muntin bar sold by Allmetal to Oldcastle Building Envelope is comprised of approximately 81% recycled material including 44% pre-consumer content and 37% post-consumer content.

Allmetal strives to recycle all manufacturing by-products and waste. Virtually all manufacturing scrap and by-products, including aluminum, steel, corrugated products, nylon and plastic are recycled.

We have a social responsibility to ensure that our activities do not have a negative impact on the environment. Our goal is to have a net positive environmental impact.

Please contact us if you wish to have additional information regarding environmental issues as they relate to Allmetal, Inc.

Very truly yours,
Allmetal, Inc.

Corinne M. Wiegand
Raw Materials Director

LEED Green Building Rating System

Sealant Information Pertaining to LEED

Credit 4.1: Low-Emitting Materials, Adhesives & Sealants

Intent: Reduce the quantity of indoor air contaminants that are odorous, potentially irritating and/or harmful to the comfort and well being of installers and occupants.

Requirements: The VOC content of adhesives and sealants used must be less than the current VOC content limits of South Coast Air Quality Management District (SCAQMD) Rule #1168, and all sealants used as fillers must meet or exceed the requirements of the Bay Area Air Quality Management District Regulation 8, Rule 51.

For Credits: VOC content must be @ or below 250 g/L

VOC content of GE's Silicone Sealants:

- SilPruf LM SCS2700 – 27 g/L
- SilPruf SCS2000 – 20 g/L
- SilPruf NB SCS9000 – 37 g/L
- UltraGlaze SSG4000 – 31 g/L
- UltraGlaze SSG4000AC – 37 g/L
- UltraGlaze SSG4400 – 27 g/L (upon mixing)
- Construction SCS1200 – 23 g/L
- Contractors SCS1000 – 20 g/L
- SilGlaze II SCS2800 – 33 g/L
- Contractors-N SCS1800 – 32 g/L
- Sanitary SCS1700 – 20 g/l
- Paintable SCS7000 – 39 g/L
- IGS3723 – 27 g/L
- RCS20 – 53.4 g/L
- IGS3103 – 23 g/L

IGS3743 - 47 g/L

~~IGS3713 - 31 g/L~~

Momentive Performance Materials
260 Hudson River Rd., Waterford, New York 12188
www.momentive.com

GLAZING INSTRUCTIONS

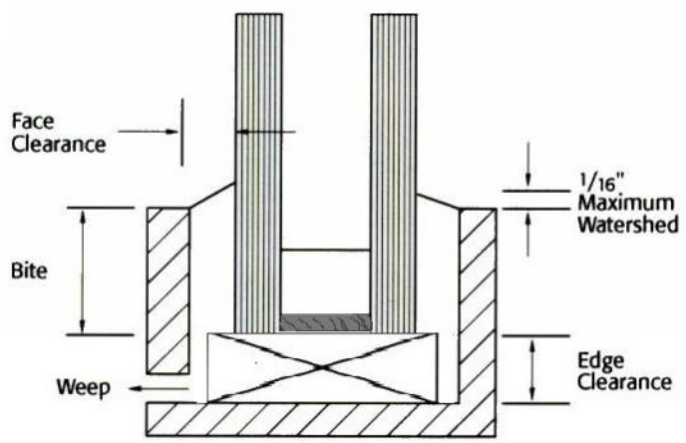
OLDCASTLE GLASS® INSULATING GLASS UNIT WARRANTY IS DEPENDENT UPON STRICT ADHERENCE TO THESE GLAZING RECOMMENDATIONS

CAUTIONS

1. The Oldcastle Glass® Insulating Glass Unit (IGU) warranty will be void under any of the following circumstances: if IGU is sitting in water or is installed in a glazing system that retains water which evaporates near the IGU edge sealant; if the IGU has not been stored and/or installed according to Oldcastle Glass® Glazing Instructions; if the IGU is installed in high humidity environments (including, but not limited to, swimming pool enclosures and greenhouses) or high vibration environments; if solar-absorbing film, shades, blinds, or any foreign material are used on or near the surface of the IGU that causes higher thermal or mechanical stresses; if non-silicone IGU is used in sloped glazing; if glass breakage occurs; or if there is any chemical or physical damage to the IGU primary and/or secondary sealants.
2. Oldcastle Glass® products cannot be used in 4-sided structural silicone glazing unless Oldcastle Glass® has provided written review of the glazing details. Failure to obtain written review voids all Oldcastle Glass® warranties.
3. A determination of the compatibility between Oldcastle Glass® products and any other glazing system component (i.e. sealants, gaskets, tapes, setting blocks, metal finishes, etc.) is not the responsibility of Oldcastle Glass®. Failure of any Oldcastle Glass® product due to incompatibility with any other product voids all Oldcastle Glass® warranties. Acetoxy silicone used with neutral-cure silicone units voids all Oldcastle Glass® warranties unless Oldcastle Glass® Technical Services pre-approved the glazing details in writing.
4. Silicone setting blocks must be used in silicone structural glazing and in sloped glazing applications; the silicone blocks must be compatible with the silicone IG sealant.
5. Installation of units without all sides supported (i.e. butt glazed without interior mullion support) voids all warranties unless Oldcastle Glass® has given prior written review of the glazing details.
6. Do NOT use razor blades or broadknife blades of any kind to clean glass. Oldcastle Glass® is not responsible for scratches and/or damage caused by glass cleaners, construction tradesmen and/or any others.
7. Use of all abrasives, chemicals, or other surface treatments should be spot tested and evaluated carefully under various lighting extremes before proceeding with use.

The following glazing instructions are intended to assist the design professional and installer. Additional glazing recommendations and guidelines provided by GANA, AAMA and IGMA must also be followed. If there is any variation in glazing recommendations, the more stringent guideline will apply.

1. **Glass Handling -** Care must be exercised in the handling and the glazing of glass to prevent damage to the glass edge. The glass must not contact the framing members during glazing. A rolling block should always be used when rotating glass to avoid corner damage. Glass must be protected from weld splatter, blasting and other impact damage. Alkali or fluorinated materials released from concrete or masonry during rainstorms can stain or etch glass. Weathering steel releases oxides while aging which can result in stained glass if proper periodic cleaning is not done. Solutions used to restore or neutralize masonry surfaces can attack first surface pyrolytic reflective coated glass.
2. **Glass Storage -** Glass should be kept on a lean of 5-7º from vertical using broad, sturdy uprights. Never store glass in sunlight without using an opaque cover to protect it. Glass should be stored in a dry, clean and cool location where the temperature is above the dew point. Circulation of dry, cool air is required especially after periods of high humidity and cyclic temperatures. If glass must be stored outdoors, use tarps or plastic coverings to protect it from getting wet, and vent periodically to prevent moisture accumulation. Repeated wetting and drying of glass surfaces can result in staining or etching of the glass.
3. **Glazing Frames -** Frames must be square, in plane, free of any internal obstructions and structurally adequate.
   - **a.** Squareness: 1/8" maximum diagonal difference
   - **b.** Bow: 1/16" maximum per any 4' length
   - **c.** Plumbness: 1/16" per 6' length
   - **d.** Corner Joint Offset: must not exceed 1/32" of adjoining members
   - **e.** Sill Deflection: 1/8" max. (when unit on setting blocks at quarter points)
   - **f.** Maximum allowable wind load deflection = unit's long dimension in inches divided by 175 or 3/4", whichever is less.
   - **g.** Expansion joints must be located between glazed openings.
   - **h.** Two-span vertical mullions should have the dead load (fixed) anchor located at their midpoint. Three-span vertical mullions should never be used.
   - **i.** Horizontal expansion joints should not be further apart than 20 feet or every 4 lites of glass, whichever is less. Expansion should be from the center towards both ends to minimize joint movements and thereby reduce stresses on sealants and connectors.
   - **j.** Twist: twist of the horizontal sill members due to weight of the glass must be limited to less than one degree
4. **Edge and Face Clearance, and Bite -** The glazing system must have adequate edge and face clearance to cushion the glass, thermally isolate the glass and framing members, and prevent glass-to-metal contact. Adequate bite is required to provide a proper seal against air and water infiltration; however, excessive bite (twice the typical bite or more) will increase thermal breakage. Refer to the chart for proper clearance and bite values.
5. **Setting & Antiwalk Blocks -** Glass should be set on 2 identical setting blocks with a Shore A durometer hardness 85 ± 5. Setting blocks should be at the sill quarter points, but not less than 6" from the edge. Antiwalk blocks must be used in dry gasket glazing, one per jamb, and should have a 50 to 70 Shore A durometer hardness. Both blocks should be sized to provide 0.1" of length per square foot of glass area, but not less than 4" long. The blocks must be wider than the unit, but less than full channel width to allow water to freely pass out of the channel. Antiwalk blocks must be of a thickness to allow a maximum 1/8" clearance between the block and the IGU's edge. The thickness for the setting block should provide the recommended nominal bite and minimum edge clearance for the glass. When a lock strip gasket glazing system is used, each setting block should be sized to provide 0.4" of length per square foot of glass area, but not less than 6" long. The lock strip gasket manufacturer should recommend the height of the blocks. Silicone IGUs require silicone setting and antiwalk blocks; non-silicone IGUs require setting and antiwalk blocks that are compatible with the specific IG sealants used.
6. **Weep Systems -** The glazing system must be designed to prevent the accumulation of moisture in the glazing channels for prolonged periods. This applies to dry, wet and lock strip glazing. Oldcastle Glass® recommends 3 weep holes, 5/16" diameter or equivalent, per sill - one at the center point of the span and one each 4" inboard of the unit corners. For a door and window wraparound gasket, provide sufficient weep holes to prevent retention of water at the unit edges.
7. **Structural Gasket Glazing (Lock Strip Glazing) -** This system must have a continuous wet sealant applied as a cap bead to the exterior glazing leg.
8. **Wedge Gasket Glazing -** The wedge must be inserted starting at the mid-point of the unit's width and height. Wedging should never be started at unit's corners.
9. **Pressure Wall Gaskets -** These gaskets must apply their sealing pressure onto the glass uniformly 1/8" to 9/16" from the unit edge of not more than 10 pounds per linear inch and not less than 4 pounds per linear inch. Torque controlled wrenches are required to achieve uniform bolt tightening. Tighten bolts at quarter points of sill, then quarter points of head, then quarter points of jambs, and then the remaining bolts.
10. **Glazing Gaskets**- All gaskets must remain resilient for the IGU warranty period.
11. **Glazing Sealants** – Because glazing sealants may contain plasticizing oils or solvents, their compatibility with the IGU sealants must be verified by the end user.
12. **High-risk installations** – Should be reviewed by a professional engineer.
13. **Capillary breather tubes** - Recommended for use with IGUs that experience an elevation difference of 2,500 ft. or more in transportation or installation location from the IGU manufacturing elevation. The IGUs must stabilize for a minimum of 72 hours at final destination prior to sealing the tubes. The capillary tube must be installed on the vertical dimension of the unit with the crimped end pointed downward along the vertical edge. Oldcastle Glass® Closing Procedure for Capillary Tubes is available on request from any Oldcastle Glass® plant. Failure to follow the closing procedure will void the IGU warranty. Must follow storage instructions in # 2. Glass Storage.



TYPICAL FACE & EDGE CLEARANCE & BITE

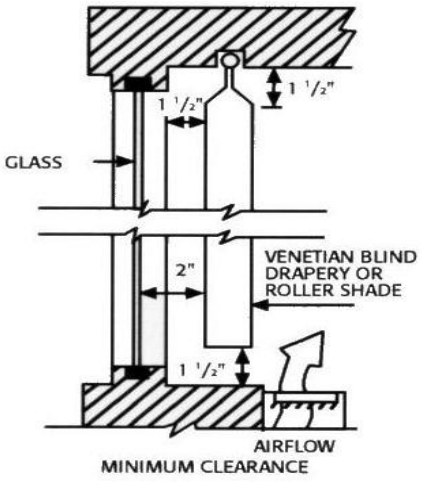
GLASS TYPE	GLASS THICKNESS inches	GLASS THICKNESS mm	MINIMUM FACE CLEARANCE inches	MINIMUM EDGE CLEARANCE inches	BITE inches
Single Glazing	3/32	2.5	1/16	1/8	1/4
	1/8 (1)	3	1/8	1/8	1/4
	1/8 (2)	3	1/8	1/4	3/8
	5/32	4	1/8	3/16	5/16
	3/16 (1)	5	1/8	3/16	5/16
	3/16 (2)	5	1/8	1/4	3/8
	1/4	6	1/8	1/4	3/8
	3/8	10	3/16	5/16	7/16
	1/2	12	1/4	3/8	7/16
	5/8	16	1/4	3/8	1/2
	3/4	19	1/4	1/2	5/8
	1	25	1/4	1/2	3/4
Spandrel	1/4	6	3/16	1/4	1/2
Insulating Glass	1/2	12	1/8	1/8	1/2
	5/8	16	1/8	1/8	1/2
	3/4	19	3/16	1/4	1/2
	1	25	3/16	1/4	1/2
	1-1/8	28	3/16	1/4	1/2

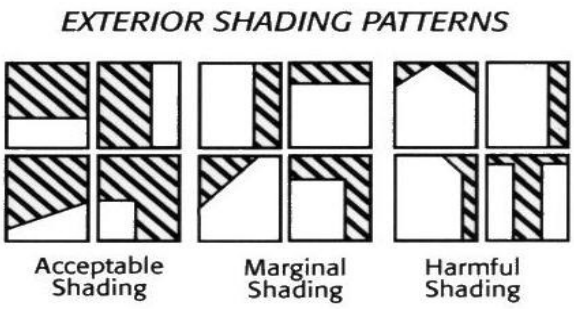
(1)Annealed glass (2)Fully tempered and heat-strengthened glass

Thermal Stress

Thermally induced edge stresses are usually the result of the warmer center portion of a glass lite being exposed to solar energy and wanting to expand more than the cooler edges. The amount of thermal stress is dependent on the glass type, size, thickness, and shape, and how it is isolated from the framing system. Other factors are building orientation, interior shading devices, exterior shading patterns, heating register location, etc. Heat-strengthening and tempering increase glass edge strength and decrease the chances for thermal breakage. The following conditions must be taken into account when considering the effects of thermal stress:

1. **Interior Heat Traps** — These situations occur when there is inadequate air circulation to properly remove heat from behind the glass. Spandrel areas are a good example of where glass must be heat-strengthened or tempered to avoid thermal stress breakage. Insulation must be held back from the surface of heat-strengthened spandrel glass a minimum of 1". Placing insulation against the back of spandrel glass is not permitted without a thermal stress review and written approval.
   In vision areas, air movement must not be restricted. Suspended ceilings must be well to the room side to allow natural convection. Or the head area should include vents that provide a minimum one square inch of ventilation for each inch of glass width. Or the glass should be heat-strengthened or tempered.
2. **Interior Shading** — Draperies, venetian blinds or other interior shading devices must be hung with space to permit natural air movement over the room side of the glass. The following criteria must be met to avoid formation of a heat trap:
   A. Minimum 1-1/2" clearance required top and bottom, or one side and bottom, between the shading device and the surrounding construction.
   B. Minimum 2" clearance between glass and shading device.
   C. Heat/cooling outlets must be to the room side of the shading device with airflow directed away from the glass.
   D. Use mechanical stops to prevent complete closure of blinds to 60% of closed position.
   Heat-strengthening or tempering of the glass may be necessary to offset the effects of a lack of adequate ventilation.
3. **Exterior Shading** — Shadows cast by overhangs, light shelves, surrounding structures, trees and shrubbery can create shading patterns on the glass, creating thermal edge stress. Maximum stress occurs when 25% or less area of a lite is shaded and the shade includes more than 25% of the perimeter. Generally, horizontal, vertical, and diagonal shading patterns are not as critical as shading that combines several patterns. Double diagonal shading is generally the most critical pattern. See the sketches of typical shading patterns that are labeled "Acceptable", "Marginal", and "Harmful". Oldcastle Glass® Technical Services will offer suggestions on the need to heat-treat the IGU when requested.





Submit requests to: Oldcastle Glass®
Technical Services Department
1273 N. Church Street, Unit 100A
Moorestown, NJ 08057

Oldcastle BuildingEnvelope™

Date: March 7, 2012
Customer: St. Albans Glass
Project: Hotel VT
Location:
Glass Type: IG-1& IG-2

INSULATING GLASS UNIT PERFORMANCE DATA

	ID #		Notes
Outboard:	5284	1/4" PPG Solarban® 60 on Clear Low-E #2	a
Air Space:	2	1/2" Spacer, (Argon Filled)	
Inboard:	5012	1/4" Clear	a

Nominal Thickness: **0.946 Inches** f

Performance Properties	**COG Results***	**Units**
Transmittance		
Visible Light	70	%
Solar Energy	33	%
Ultraviolet	19	%
Reflectance		
Visible Light (Exterior)	11	%
Visible Light (Interior)	12	%
[illegible]	29	%
Thermal		
Winter Nighttime		
U-factor/U-Value	0.24	Btu/hr-ft^2-^{o}F
Summer Daytime		
U-factor/U-Value	0.21	Btu/hr-ft^2-^{o}F
Shading Coefficient	0.43	-
Solar Heat Gain Coefficient	0.38	-
Relative Heat Gain	89	Btu/hr-ft^2
Light to Solar Gain	1.84	-

***Vertically Glazed Center Of Glass (COG) Results Calculated Using LBNL Window 5.2 Software.**

Notes: a) NFRC certified spectral data file
b) Data generated by Oldcastle BuildingEnvelope™
c) Average solar data
d) Simulated with LBNL Optics 5.1
e) Vendor supplied spectral data file
f) Please reference ASTM C1036 and C1172 for allowable glass thickness variations

SUSTAINABLE SITES

Yes

SS Prerequisite 1: Construction Activity Pollution Prevention

Required

Accomplished via the design from civil engineer

Intent

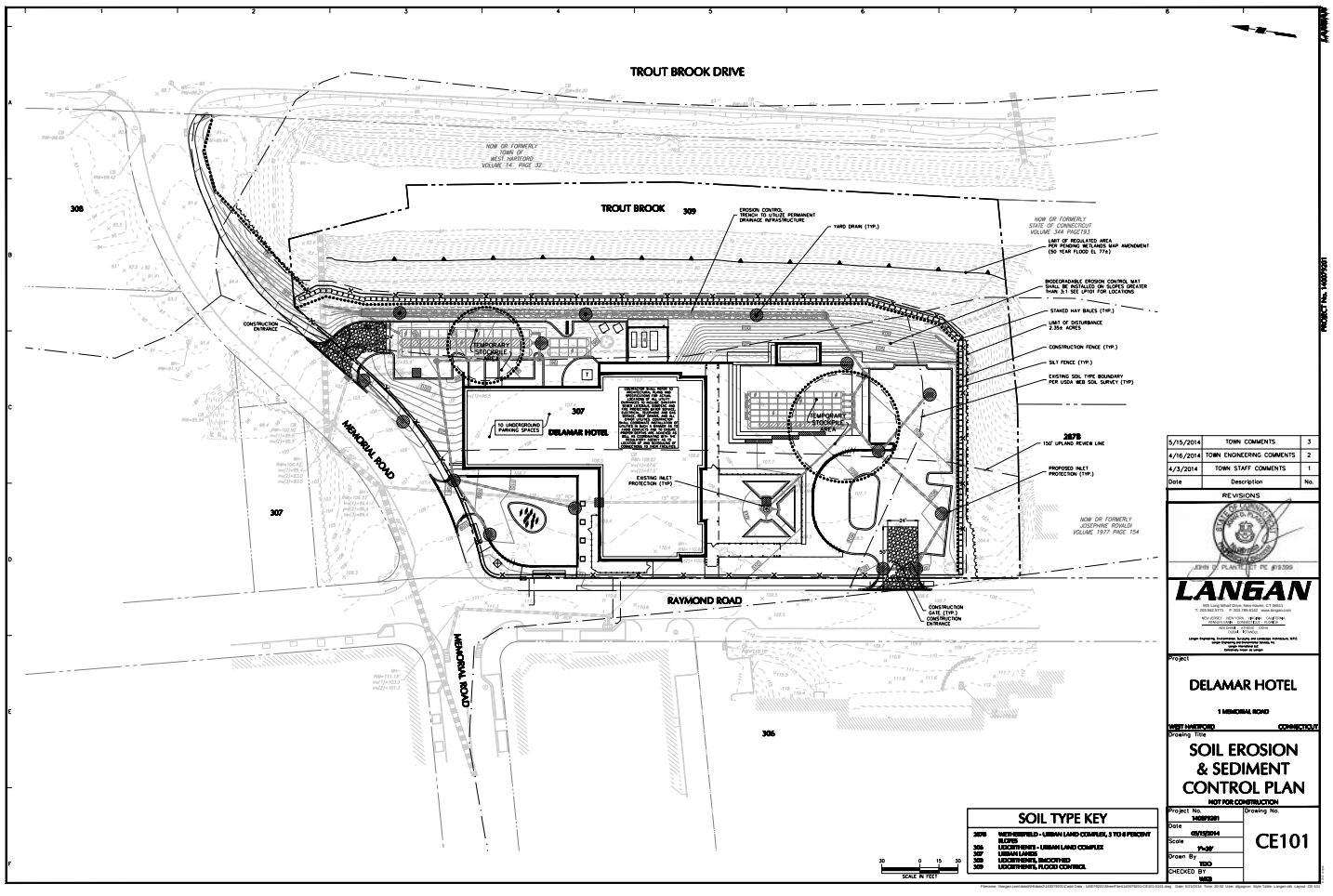
To reduce pollution from construction activities by controlling soil erosion, waterway sedimentation and airborne dust generation.

Requirements

Create and implement an erosion and sedimentation control plan for all construction activities associated with the project. The plan must conform to the erosion and sedimentation requirements of the 2003 EPA Construction General Permit OR local standards and codes, whichever is more stringent. The plan must describe the measures implemented to accomplish the following objectives:

- To prevent loss of soil during construction by stormwater runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.
- To prevent sedimentation of storm sewers or receiving streams.
- To prevent pollution of the air with dust and particulate matter.

The EPA's construction general permit outlines the provisions necessary to comply with Phase I and Phase II of the National Pollutant Discharge Elimination System (NPDES) program. While the permit only applies to construction sites greater than 1 acre, the requirements are applied to all projects for the purposes of this prerequisite. Information on the EPA construction general permit is available at http://cfpub.epa.gov/npdes/stormwater/cgp.cfm.



Yes

SS Credit 2: Development Density and Community Connectivity

5 Points **Can meet standards for either compliance path - primarily due to proximity of BBS**

Intent

To channel development to urban areas with existing infrastructure, protect greenfields, and preserve habitat and natural resources.

Requirements

OPTION 1. Development Density

Construct or renovate a building on a previously developed site AND in a community with a minimum density of 60,000 square feet per acre net. The density calculation is based on a typical two-story downtown development and must include the area of the project being built.

OR

OPTION 2. Community Connectivity

Construct or renovate a building on a site that meets the following criteria:

- Is located on a previously developed site
- Is within 1/2 mile of a residential area or neighborhood with an average density of 10 units per acre net
- Is within 1/2 mile of at least 10 basic services
- Has pedestrian access between the building and the services

For mixed-use projects, no more than 1 service within the project boundary may be counted as 1 of the 10 basic services, provided it is open to the public. No more than 2 of the 10 services required may be anticipated (i.e., at least 8 must be existing and operational). In addition, the anticipated services must demonstrate that they will be operational in the locations indicated within 1 year of occupation of the applicant project.

Examples of basic services include the following:

- Bank ✓
- Place of Worship ✓
- Convenience Grocery
- Day Care Center ✓
- Cleaners ✓
- Fire Station ✓
- Beauty Salon ✓
- Hardware ✓
- Laundry
- Library ✓
- Medical or Dental Office ✓
- Senior Care Facility
- Park ✓
- Pharmacy ✓
- Post Office ✓
- Restaurant ✓
- School ✓
- Supermarket ✓
- Theater ✓
- Community Center
- Fitness Center ✓
- Museum ✓

Yes

SS Credit 4.1: Alternative Transportation—Public Transportation Access

6 Points

Via option 2 - Bus stop proximity

Intent

To reduce pollution and land development impacts from automobile use.

Requirements

OPTION 1. Rail Station Proximity

Locate the project within 1/2-mile walking distance (measured from a main building entrance) of an existing or planned and funded commuter rail, light rail or subway station.

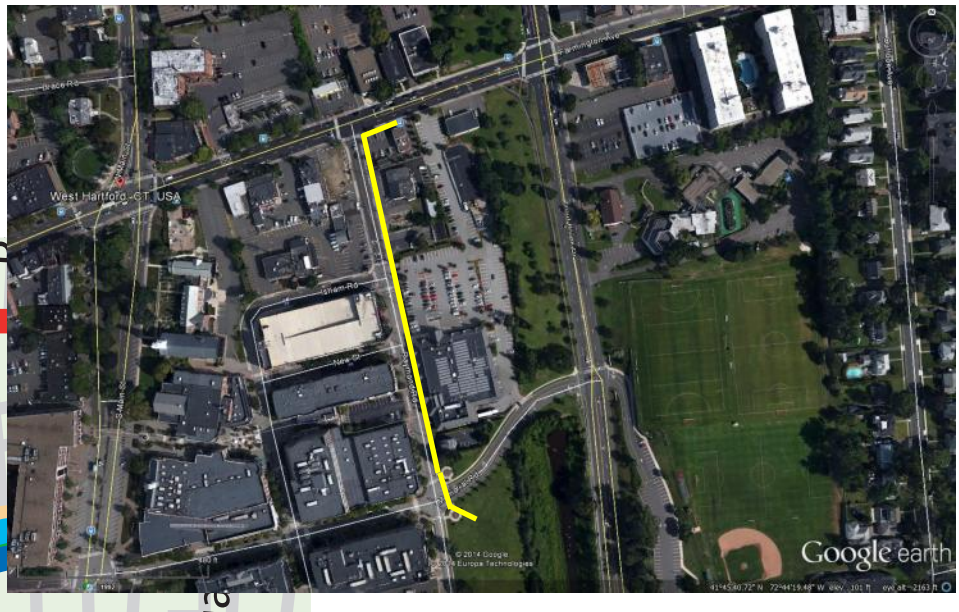
OR

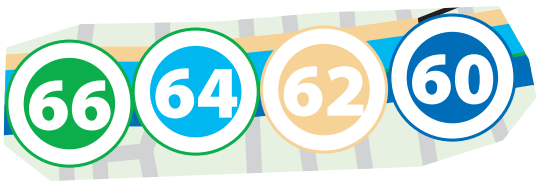
OPTION 2. Bus Stop Proximity

Locate the project within 1/4-mile walking distance (measured from a main building entrance) of 1 or more stops for 2 or more public, campus, or private bus lines usable by building occupants.

Potential Technologies & Strategies

Perform a transportation survey of future building occupants to identify transportation needs. Locate the building near mass transit.





1 stop for 4 routes within 1/4 mile

Yes

SS Credit 4.2: Alternative Transportation—Bicycle Storage and Changing Rooms

1 Point

secure storage and shower/changing provided

Intent

To reduce pollution and land development impacts from automobile use.

Requirements

CASE 1. Commercial or Institutional Projects

Provide secure bicycle racks and/or storage within 200 yards of a building entrance for 5% or more of all building users (measured at peak periods)

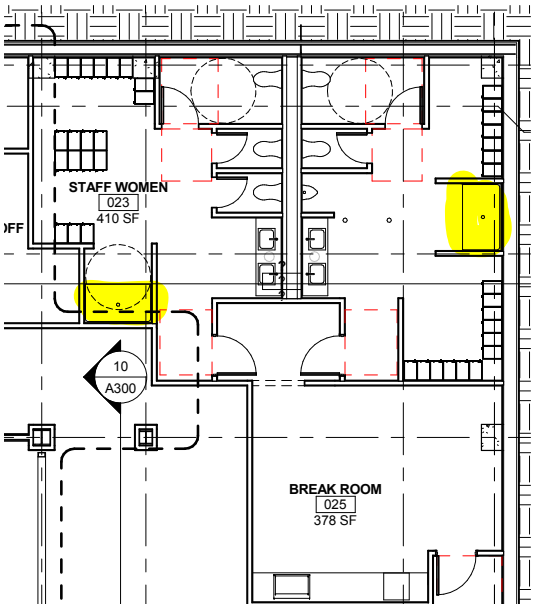
Provide shower and changing facilities in the building, or within 200 yards of a building entrance, for 0.5% of full-time equivalent (FTE) occupants.

CASE 2. Residential Projects

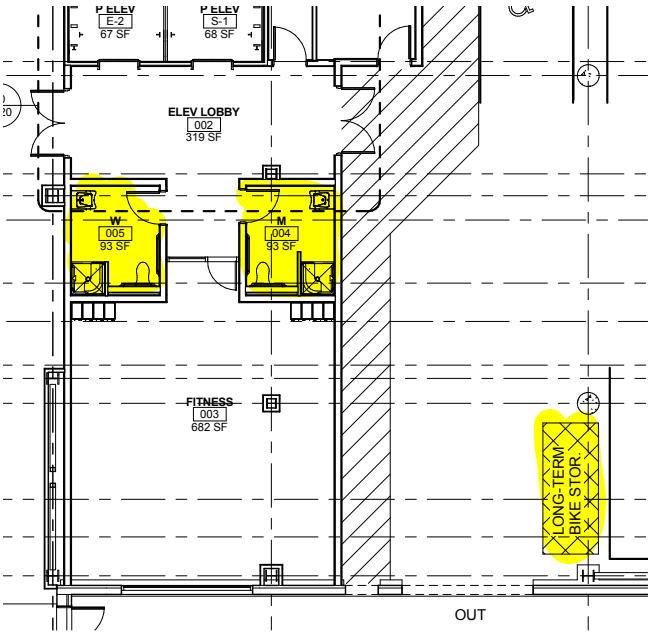
Provide covered storage facilities for securing bicycles for 15% or more of building occupants.

Potential Technologies & Strategies

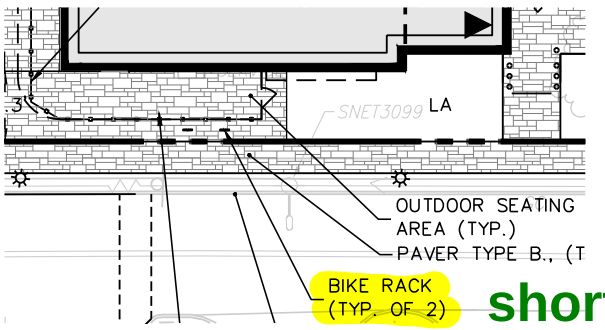
Design the building with transportation amenities such as bicycle racks and shower/changing facilities.



staff locker rooms



long term storage for staff other FTE users & more changing facilities at fitness area



short term racks outside

Yes

SS Credit 4.3: Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles

3 Points

All four options are feasible The particular approach is under consideration

Intent

To reduce pollution and land development impacts from automobile use.

Requirements

OPTION 1

Provide preferred parking[1] for low-emitting and fuel-efficient vehicles[2] for 5% of the total vehicle parking capacity of the site. Providing a discounted parking rate is an acceptable substitute for preferred parking for low-emitting/fuel-efficient vehicles. To establish a meaningful incentive in all potential markets, the parking rate must be discounted at least 20%. The discounted rate must be available to all customers (i.e., not limited to the number of customers equal to 5% of the vehicle parking capacity), publicly posted at the entrance of the parking area and available for a minimum of 2 years.

OR

OPTION 2

Install alternative-fuel fueling stations for 3% of the total vehicle parking capacity of the site. Liquid or gaseous fueling facilities must be separately ventilated or located outdoors.

OR

OPTION 3

Provide low-emitting and fuel-efficient vehicles[1] for 3% of full-time equivalent (FTE) occupants.

Provide preferred parking[2] for these vehicles.

OR

OPTION 4

Provide building occupants access to a low-emitting or fuel-efficient vehicle-sharing program. The following requirements must be met:

- One low-emitting or fuel-efficient vehicle must be provided per 3% of FTE occupants, assuming that 1 shared vehicle can carry 8 persons (i.e., 1 vehicle per 267 FTE occupants). For buildings with fewer than 267 FTE occupants, at least 1 low emitting or fuel-efficient vehicle must be provided.
- A vehicle-sharing contract must be provided that has an agreement of at least 2 years.

1 For the purposes of this credit, low-emitting and fuel-efficient vehicles are defined as vehicles that are either classified as Zero Emission Vehicles (ZEV) by the California Air Resources Board or have achieved a minimum green score of 40 on the American Council for an Energy Efficient Economy (ACEEE) annual vehicle rating guide.

2 For the purposes of this credit "preferred parking" refers to the parking spots that are closest to the main entrance of the project (exclusive of spaces designated for handicapped persons) or parking passes provided at a discounted price.

Yes

SS Credit 4.4: Alternative Transportation—Parking Capacity

2 Points

The project complies with Case 1, Option 1

Intent

To reduce pollution and land development impacts from automobile use.

Requirements

CASE 1. Non-Residential Projects

OPTION 1

Size parking capacity to meet but not exceed minimum local zoning requirements.

Provide preferred parking for carpools or vanpools for 5% of the total parking spaces.

OR

OPTION 2

For projects that provide parking for less than 5% of full-time equivalent (FTE) building occupants:

Provide preferred parking[1] for carpools or vanpools, marked as such, for 5% of total parking spaces. Providing a discounted parking rate is an acceptable substitute for preferred parking for carpool or vanpool vehicles. To establish a meaningful incentive in all potential markets, the parking rate must be discounted at least 20%. The discounted rate must be available to all customers (i.e., not limited to the number of customers equal to 5% of the vehicle parking capacity), publicly posted at the entrance of the parking area, and available for a minimum of 2 years.

OR

OPTION 3

Provide no new parking.

CASE 2. Residential Projects

OPTION 1

Size parking capacity to meet but not exceed minimum local zoning requirements

Provide infrastructure and support programs to facilitate shared vehicle use such as carpool drop-off areas, designated parking for vanpools, car-share services, ride boards and shuttle services to mass transit.

1 For the purposes of this credit "preferred parking" refers to the parking spots that are closest to the main entrance of the project (exclusive of spaces designated for handicapped persons) or parking passes provided at a discounted price.

Yes

SS Credit 5.2: Site Development—Maximize Open Space

1 Point **Because SSc2 achieved, ability to count pedestrian hardscape**

Intent

To promote biodiversity by providing a high ratio of open space to development footprint.

Requirements

CASE 1. Sites with Local Zoning Open Space Requirements

Reduce the development footprint[1] and/or provide vegetated open space within the project boundary such that the amount of open space exceeds local zoning requirements by 25%.

CASE 2. Sites with No Local Zoning Requirements (e.g. some university campuses, military bases)

Provide a vegetated open space area adjacent to the building that is equal in area to the building footprint.

CASE 3. Sites with Zoning Ordinances but No Open Space Requirements

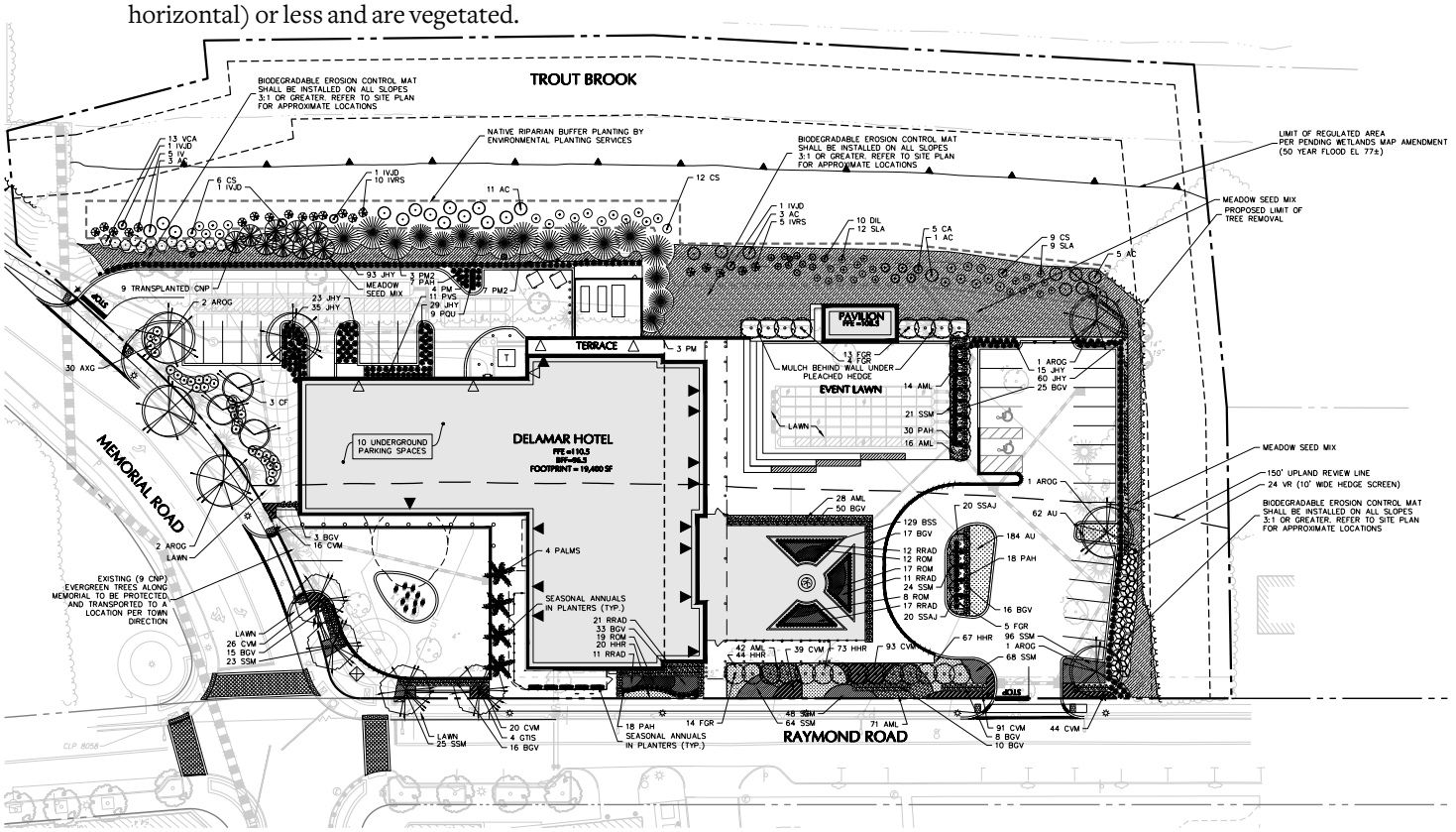
Provide vegetated open space equal to 20% of the project site area.

ALL CASES

For projects in urban areas that earn SS Credit 2: Development Density and Community Connectivity, vegetated roof areas can contribute to credit compliance.

For projects in urban areas that earn SS Credit 2: Development Density and Community Connectivity, pedestrian-oriented hardscape areas can contribute to credit compliance. For such projects, a minimum of 25% of the open space counted must be vegetated.

Wetlands or naturally designed ponds may count as open space and the side slope gradients average 1:4 (vertical: horizontal) or less and are vegetated.



Yes

SS Credit 6.1: Stormwater Design—Quantity Control

1 Point

Civil engineer's stormwater management plan complies

Intent

To limit disruption of natural hydrology by reducing impervious cover, increasing on-site infiltration, reducing or eliminating pollution from stormwater runoff and eliminating contaminants.

Requirements

CASE 1. Sites with Existing Imperviousness 50% or Less

OPTION 1

Implement a stormwater management plan that prevents the postdevelopment peak discharge rate and quantity from exceeding the predevelopment peak discharge rate and quantity for the 1- and 2-year 24-hour design storms.

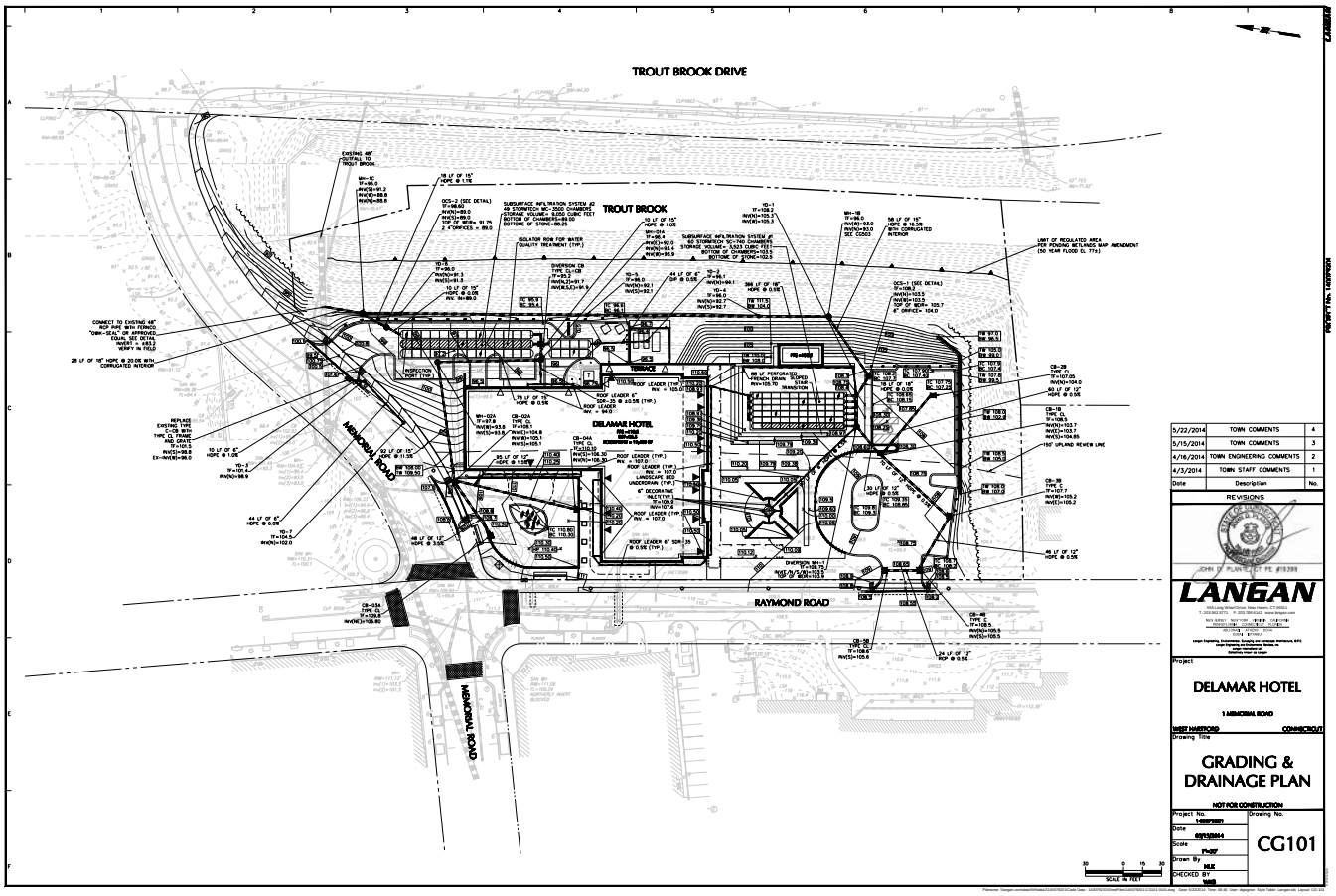
OR

OPTION 2

Implement a stormwater management plan that protects receiving stream channels from excessive erosion. The stormwater management plan must include stream channel protection and quantity control strategies.

CASE 2. Sites with Existing Imperviousness Greater Than 50%

Implement a stormwater management plan that results in a 25% decrease in the volume of stormwater runoff from the 2-year 24-hour design storm.



Yes

SS Credit 6.2: Stormwater Design—Quality Control

1 Point Civil engineer's stormwater management plan complies

Intent

To limit disruption and pollution of natural water flows by managing stormwater runoff.

Requirements

Implement a stormwater management plan that reduces impervious cover, promotes infiltration and captures and treats the stormwater runoff from 90% of the average annual rainfall[1] using acceptable best management practices (BMPs).

BMPs used to treat runoff must be capable of removing 80% of the average annual postdevelopment total suspended solids (TSS) load based on existing monitoring reports. BMPs are considered to meet these criteria if:

- They are designed in accordance with standards and specifications from a state or local program that has adopted these performance standards,

OR

- There exists infield performance monitoring data demonstrating compliance with the criteria. Data must conform to accepted protocol (e.g., Technology Acceptance Reciprocity Partnership [TARP], Washington State Department of Ecology) for BMP monitoring.

Potential Technologies & Strategies

Use alternative surfaces (e.g., vegetated roofs, pervious pavement, grid pavers) and nonstructural techniques (e.g., rain gardens, vegetated swales, disconnection of imperviousness, rainwater recycling) to reduce imperviousness and promote infiltration and thereby reduce pollutant loadings.

Use sustainable design strategies (e.g., low-impact development, environmentally sensitive design) to create integrated natural and mechanical treatment systems such as constructed wetlands, vegetated filters and open channels to treat stormwater runoff.

1 There are 3 distinct climates in the United States that influence the nature and amount of annual rainfall. Humid watersheds are defined as those that receive at least 40 inches of rainfall each year. Semiarid watersheds receive between 20 and 40 inches of rainfall per year, and arid watersheds receive less than 20 inches of rainfall per year. For this credit, 90% of the average annual rainfall is equivalent to treating the runoff from the following (based on climate):
- Humid Watersheds — 1 inch of rainfall
- Semiarid Watersheds — 0.75 inches of rainfall
- Arid Watersheds — 0.5 inches of rainfall

Yes

SS Credit 7.1: Heat Island Effect—Nonroof

1 Point More than 50% of site hardscape has an SRI value greater than 29

Intent

To reduce heat islands[1] to minimize impacts on microclimates and human and wildlife habitats.

Requirements

OPTION 1

Use any combination of the following strategies for 50% of the site hardscape (including roads, sidewalks, courtyards and parking lots):

- Provide shade from the existing tree canopy or within 5 years of landscape installation. Landscaping (trees) must be in place at the time of occupancy.
- Provide shade from structures covered by solar panels that produce energy used to offset some nonrenewable resource use.
- Provide shade from architectural devices or structures that have a solar reflectance index[2] (SRI) of at least 29.
- Use hardscape materials with an SRI of at least 29.
- Use an open-grid pavement system (at least 50% pervious).

OR

OPTION 2

Place a minimum of 50% of parking spaces under cover[3]. Any roof used to shade or cover parking must have an SRI of at least 29, be a vegetated green roof or be covered by solar panels that produce energy used to offset some nonrenewable resource use.

SUMMER WHEAT (SRI 48)

Yes

SS Credit 7.2: Heat Island Effect—Roof

1 Point

Flat roof areas = SRI over 78
Sloped roof areas = SRI over 29

Intent

To reduce heat islands[1] to minimize impacts on microclimates and human and wildlife habitats.

Requirements

OPTION 1

Use roofing materials with a solar reflectance index[2] (SRI) equal to or greater than the values in the table below for a minimum of 75% of the roof surface.

Roofing materials having a lower SRI value than those listed below may be used if the weighted rooftop SRI average meets the following criteria:

$$\frac{\text{Area Roof Meeting Minimum SRI}}{\text{Total Roof Area}} \times \frac{\text{SRI of Installed Roof}}{\text{Required SRI}} \geq 75\%$$

Roof Type	Slope	SRI
Low-sloped roof	≤ 2:12	78
Steep-sloped roof	> 2:12	29

OR

OPTION 2

Install a vegetated roof that covers at least 50% of the roof area.

OR

OPTION 3

Install high-albedo and vegetated roof surfaces that, in combination, meet the following criteria:

$$\frac{\text{Area Roof Meeting Minimum SRI}}{0.75} + \frac{\text{Area of Vegetated Roof}}{0.5} \geq \text{Total Roof Area}$$

Roof Type	Slope	SRI
Low-sloped roof	≤ 2:12	78
Steep-sloped roof	> 2:12	29

1 Heat islands are defined as thermal gradient differences between developed and undeveloped areas.

2 The solar reflectance index (SRI) is a measure of the constructed surface's ability to reflect solar heat, as shown by a small temperature rise. It is defined so that a standard black surface (reflectance 0.05, emittance 0.90) is 0 and a standard white surface (reflectance 0.80, emittance 0.90) is 100. To calculate the SRI for a given material, obtain the reflectance value and emittance value for the material. SRI is calculated according to ASTM E 1980. Reflectance is measured according to ASTM E 903, ASTM E 1918 or ASTM C 1549. Emittance is measured according to ASTM E 408 or ASTM C 1371.

SRI (Solar Reflectivity Index) Values – ORNL (DOE) Calculator, ASTM E 1980-1

Firestone UNA-CLAD™ Metal PVDF* Finishes	SRI
Almond	67
Bone White	87
Brandywine	23
Charcoal Gray	28
Cityscape	37
Colonial Red	31
Dark Bronze	24
Dark Ivy	22
Extra Dark Bronze	0
Hartford Green	2
Hemlock Green	33
Mansard Brown	30
Matte Black	24
Medium Bronze	31
Patina Green	25
Regal Blue	12
Regal Red	46
Sandstone	58
Sherwood Green	26
Sierra Tan	37
Sky Blue	29
Slate Gray	38
Stone White	67
Teal	7
Terra Cotta	36
Tropical Patina	27
Award Blue	9
Electric Blue	16
Champagne Metallic	38
Classic Copper	46
Silver Metallic	67

*** PVDF** – Kynar 500® / Hylar 5000®

Firestone Products	SRI
RubberGard™ EcoWhite™ EPDM Membrane	99
UltraPly™ TPO White Membrane	102
UltraPly™ TPO XR White Membrane	102
ReflexEON™ TPO White Membrane	109
UltraWhite™ SBS Cap	87
UltraWhite™ SBS FR Cap	89
UltraWhite™ SBS Torch	87
UltraWhite™ SBS FR Torch	89
UltraWhite™ SBS Glass	87
UltraWhite™ SBS Glass FR	89
UltraWhite™ SBS Glass FR Torch	89
UltraWhite™ SBS Premium	87
UltraWhite™ SBS Premium FR	89
UltraWhite™ SBS Premium Torch	87
UltraWhite™ SBS Premium FR Torch	89
UltraWhite™ APP 180	89
UltraWhite™ APP 180 FR	89
UltraWhite™ APP 180 FR COOL	89
UltraWhite™ APP Premium FR	89
SBS Metal Flash-AL™	92
AcryliTop™ PC-100 White Coating & Acrylic Base Coat for Asphalt Systems	102
AcryliTop™ PC-100 White Coating & AcryliTop PC-100 Base Coat for EPDM Systems	102

Maybe

SS Credit 8: Light Pollution Reduction

1 Point under review by lighting designers

Intent

To minimize light trespass from the building and site, reduce sky-glow to increase night sky access, improve nighttime visibility through glare reduction and reduce development impact from lighting on nocturnal environments.

Requirements

Project teams must comply with 1 of the 2 options for interior lighting AND the requirement for exterior lighting.

For Interior Lighting

OPTION 1

Reduce the input power (by automatic device) of all nonemergency interior luminaires with a direct line of sight to any openings in the envelope (translucent or transparent) by at least 50% between 11 p.m. and 5 a.m. After-hours override may be provided by a manual or occupant-sensing device provided the override lasts no more than 30 minutes.

OR

OPTION 2

All openings in the envelope (translucent or transparent) with a direct line of sight to any nonemergency luminaires must have shielding (controlled/closed by automatic device for a resultant transmittance of less than 10% between 11 p.m. and 5 a.m.).

For Exterior Lighting

Light areas only as required for safety and comfort. Lighting power densities must not exceed ANSI/ASHRAE/IESNA Standard 90.1-2007 (with errata but without addenda[1]) for the classified zone. Meet exterior lighting control requirements from ANSI/ASHRAE/IESNA Standard 90.1-2007 (with errata but without addenda[1]) Exterior Lighting Section, without amendments.

Classify the project under 1 of the following zones, as defined in IESNA RP-33, and follow all the requirements for that zone:

LZ1: Dark (developed areas within national parks, state parks, forest land and rural areas)

Design exterior lighting so that all site and building-mounted luminaires produce a maximum initial illuminance value no greater than 0.01 horizontal and vertical footcandles at the site boundary and beyond. Document that 0% of the total initial designed fixture lumens (sum total of all fixtures on site) are emitted at an angle of 90 degrees or higher from nadir (straight down).

1 Project teams wishing to use ASHRAE approved addenda for the purposes of this credit may do so at their discretion. Addenda must be applied consistently across all LEED credits.

2 To establish the zone designated by an organization with local jurisdiction, such as the local zoning authority.

LZ2: Low (**primarily residential zones, neighborhood business districts, light industrial areas with limited nighttime use and residential mixed-use areas**)

Design exterior lighting so that all site and building-mounted luminaires produce a maximum initial illuminance value no greater than 0.10 horizontal and vertical footcandles at the site boundary and no greater than 0.01 horizontal footcandles 10 feet beyond the site boundary. Document that no more than 2% of the total initial designed fixture lumens (sum total of all fixtures on site) are emitted at an angle of 90 degrees or higher from nadir (straight down).

LZ3: Medium (**all other areas not included in LZ1, LZ2 or LZ4, such as commercial/ industrial, and high-density residential**)

Design exterior lighting so that all site and building-mounted luminaires produce a maximum initial illuminance value no greater than 0.20 horizontal and vertical footcandles at the site boundary and no greater than 0.01 horizontal footcandles 15 feet beyond the site. Document that no more than 5% of the total initial designed fixture lumens (sum total of all fixtures on site) are emitted at an angle of 90 degrees or higher from nadir (straight down).

LZ4: High[2] (**high-activity commercial districts in major metropolitan areas**)

Design exterior lighting so that all site and building-mounted luminaires produce a maximum initial illuminance value no greater than 0.60 horizontal and vertical footcandles at the site boundary and no greater than 0.01 horizontal footcandles 15 feet beyond the site. Document that no more than 10% of the total initial designed fixture lumens (sum total of all fixtures on site) are emitted at an angle of 90 degrees or higher from nadir (straight down).

LZ2, LZ3 and LZ4 - For site boundaries that abut public rights-of-way, light trespass requirements may be met relative to the curb line instead of the site boundary.

For All Zones

Illuminance generated from a single luminaire placed at the intersection of a private vehicular driveway and public roadway accessing the site is allowed to use the centerline of the public roadway as the site boundary for a length of 2 times the driveway width centered at the centerline of the driveway.

Potential Technologies & Strategies

Adopt site lighting criteria to maintain safe light levels while avoiding off-site lighting and night sky pollution. Minimize site lighting where possible, and use computer software to model the site lighting. Technologies to reduce light pollution include full cutoff luminaires, low-reflectance surfaces and low-angle spotlights.

Yes

WE Prerequisite 1: Water Use Reduction

Required

Mechanical designer confirmed.

Intent

To increase water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.

Requirements

Employ strategies that in aggregate use 20% less water than the water use baseline calculated for the building (not including irrigation).

Calculate the baseline according to the commercial and/or residential baselines outlined below.[1] Calculations are based on estimated occupant usage and must include only the following fixtures and fixture fittings (as applicable to the project scope): water closets, urinals, lavatory faucets, showers, kitchen sink faucets and prerinse spray valves.

Commercial Fixtures, Fittings, and Appliances	Current Baseline
Commercial toilets	1.6 gallons per flush (gpf)* Except blow-out fixtures: 3.5 (gpf)
Commercial urinals	1.0 (gpf)
Commercial lavatory (restroom) faucets	2.2 gallons per minute (gpm) at 60 pounds per square inch (psi), private applications only (hotel or motel guest rooms, hospital patient rooms) 0.5 (gpm) at 60 (psi)** all others except private applications 0.25 gallons per cycle for metering faucets
Commercial prerinse spray valves (for food service applications)	Flow rate ≤ 1.6 (gpm) (no pressure specified; no performance requirement)

Residential Fixtures, Fittings, and Appliances	Current Baseline
Residential toilets	1.6 (gpf)***
Residential lavatory (bathroom) faucets	2.2 (gpm) at 60 psi
Residential kitchen faucet	
Residential showerheads	2.5 (gpm) at 80 (psi) per shower stall****

* EPAct 1992 standard for toilets applies to both commercial and residential models.
** In addition to EPAct requirements, the American Society of Mechanical Engineers standard for public lavatory faucets is 0.5 gpm at 60 psi (ASME A112.18.1-2005). This maximum has been incorporated into the national Uniform Plumbing Code and the International Plumbing Code.
*** EPAct 1992 standard for toilets applies to both commercial and residential models.
**** Residential shower compartment (stall) in dwelling units: The total allowable flow rate from all flowing showerheads at any given time, including rain systems, waterfalls, bodysprays, bodyspas and jets, must be limited to the allowable showerhead flow rate as specified above (2.5 gpm) per shower compartment, where the floor area of the shower compartment is less than 2,500 square inches. For each increment of 2,500 square inches of floor area thereafter or part thereof, an additional showerhead with total allowable flow rate from all flowing devices equal to or less than the allowable flow rate as specified above must be allowed. Exception: Showers that emit recirculated nonpotable water originating from within the shower compartment while operating are allowed to exceed the maximum as long as the total potable water flow does not exceed the flow rate as specified above.

1 Tables adapted from information developed and summarized by the U.S. Environmental Protection Agency (EPA) Office of Water based on requirements of the Energy Policy Act (EPAct) of 1992 and subsequent rulings by the Department of Energy, requirements of the EPAct of 2005, and the plumbing code requirements as stated in the 2006 editions of the Uniform Plumbing Code or International Plumbing Code pertaining to fixture performance.

Maybe

WE Credit 1: Water Efficient Landscaping

2–4 Points

Landscape designer reviewing - may get 2 points

Intent

To limit or eliminate the use of potable water or other natural surface or subsurface water resources available on or near the project site for landscape irrigation.

Requirements

OPTION 1. Reduce by 50% (2 points)

Reduce potable water consumption for irrigation by 50% from a calculated midsummer baseline case.

Reductions must be attributed to any combination of the following items:

- Plant species, density and microclimate factor
- Irrigation efficiency
- Use of captured rainwater
- Use of recycled wastewater
- Use of water treated and conveyed by a public agency specifically for nonpotable uses

Groundwater seepage that is pumped away from the immediate vicinity of building slabs and foundations may be used for landscape irrigation to meet the intent of this credit. However, the project team must demonstrate that doing so does not affect site stormwater management systems.

OR

OPTION 2. No Potable Water Use or Irrigation[1] (4 points)

Meet the requirements for Option 1.

AND

PATH 1

Use only captured rainwater, recycled wastewater, recycled graywater or water treated and conveyed by a public agency specifically for nonpotable uses for irrigation.

OR

PATH 2

Install landscaping that does not require permanent irrigation systems. Temporary irrigation systems used for plant establishment are allowed only if removed within 1 year of installation.

1 If the percent reduction of potable water is 100% AND the percent reduction of total water is equal to or greater than 50%, both Option 1 and Option 2 are earned.

Yes

EA Prerequisite 1: Fundamental Commissioning of Building Energy Systems

Required

Intent

To verify that the project's energy-related systems are installed, and calibrated to perform according to the owner's project requirements, basis of design and construction documents.

Benefits of commissioning include reduced energy use, lower operating costs, fewer contractor callbacks, better building documentation, improved occupant productivity and verification that the systems perform in accordance with the owner's project requirements.

Requirements

The following commissioning process activities must be completed by the project team:

- Designate an individual as the commissioning authority (CxA) to lead, review and oversee the completion of the commissioning process activities.
  - The CxA must have documented commissioning authority experience in at least 2 building projects.
  - The individual serving as the CxA must be independent of the project design and construction management, though the CxA may be an employee of any firm providing those services. The CxA may be a qualified employee or consultant of the owner.
  - The CxA must report results, findings and recommendations directly to the owner.
  - For projects smaller than 50,000 gross square feet, the CxA may be a qualified person on the design or construction team who has the required experience.
- The owner must document the owner's project requirements. The design team must develop the basis of design. The CxA must review these documents for clarity and completeness. The owner and design team must be responsible for updates to their respective documents.
- Develop and incorporate commissioning requirements into the construction documents.
- Develop and implement a commissioning plan.
- Verify the installation and performance of the systems to be commissioned.
- Complete a summary commissioning report.

Commissioned Systems

Commissioning process activities must be completed for the following energy-related systems, at a minimum:

- Heating, ventilating, air conditioning and refrigeration (HVAC&R) systems (mechanical and passive) and associated controls
- Lighting and daylighting controls
- Domestic hot water systems
- Renewable energy systems (e.g., wind, solar)

Yes

EA Prerequisite 2: Minimum Energy Performance

Required

Intent

To establish the minimum level of energy efficiency for the proposed building and systems to reduce environmental and economic impacts associated with excessive energy use.

Requirements

OPTION 1. Whole Building Energy Simulation

Demonstrate a 10% improvement in the proposed building performance rating for new buildings, or a 5% improvement in the proposed building performance rating for major renovations to existing buildings, compared with the baseline building performance rating.

Calculate the baseline building performance rating according to the building performance rating method in Appendix G of ANSI/ASHRAE/IESNA Standard 90.1-2007 (with errata but without addenda[1]) using a computer simulation model for the whole building project.

Appendix G of Standard 90.1-2007 requires that the energy analysis done for the building performance rating method include all energy costs associated with the building project. To achieve points using this credit, the proposed design must meet the following criteria:

- Comply with the mandatory provisions (Sections 5.4, 6.4, 7.4, 8.4, 9.4 and 10.4) in Standard 90.1-2007 (with errata but without addenda[1]).
- Include all energy costs associated with the building project.
- Compare against a baseline building that complies with Appendix G of Standard 90.1-2007 (with errata but without addenda[1]). The default process energy cost is 25% of the total energy cost for the baseline building. If the building's process energy cost is less than 25% of the baseline building energy cost, the LEED submittal must include documentation substantiating that process energy inputs are appropriate.

For the purpose of this analysis, process energy is considered to include, but is not limited to, office and general miscellaneous equipment, computers, elevators and escalators, kitchen cooking and refrigeration, laundry washing and drying, lighting exempt from the lighting power allowance (e.g., lighting integral to medical equipment) and other (e.g., waterfall pumps).

Regulated (non-process) energy includes lighting (for the interior, parking garage, surface parking, façade, or building grounds, etc. except as noted above), heating, ventilation and air conditioning (HVAC) (for space heating, space cooling, fans, pumps, toilet exhaust, parking garage ventilation, kitchen hood exhaust, etc.), and service water heating for domestic or space heating purposes.

Process loads must be identical for both the baseline building performance rating and the proposed building performance rating. However, project teams may follow the exceptional calculation method (ANSI/ASHRAE/IESNA Standard 90.1-2007 G2.5) to document measures that reduce process loads. Documentation of process

1 Project teams wishing to use ASHRAE approved addenda for the purposes of this credit may do so at their discretion. Addenda must be applied consistently across all LEED credits.

Yes

EA Prerequisite 3: Fundamental Refrigerant Management

Required

Intent
To reduce stratospheric ozone depletion.

Requirements
Zero use of chlorofluorocarbon (CFC)-based refrigerants in new base building heating, ventilating, air conditioning and refrigeration (HVAC&R) systems. When reusing existing base building HVAC equipment, complete a comprehensive CFC phase-out conversion prior to project completion. Phase-out plans extending beyond the project completion date will be considered on their merits.

Potential Technologies & Strategies
When reusing existing HVAC systems, conduct an inventory to identify equipment that uses CFC-based refrigerants and provide a replacement schedule for these refrigerants. For new buildings, specify new HVAC equipment in the base building that uses no CFC-based refrigerants.

Yes

EA Credit 1: Optimize Energy Performance

1–19 Points

Intent

To achieve increasing levels of energy performance beyond the prerequisite standard to reduce environmental and economic impacts associated with excessive energy use.

Requirements

Select 1 of the 3 compliance path options described below. Project teams documenting achievement using any of the 3 options are assumed to be in compliance with EA Prerequisite 2: Minimum Energy Performance.

OPTION 1. Whole Building Energy Simulation (1–19 points)

Demonstrate a percentage improvement in the proposed building performance rating compared with the baseline building performance rating. Calculate the baseline building performance according to Appendix G of ANSI/ASHRAE/IESNA Standard 90.1-2007 (with errata but without addenda[1]) using a computer simulation model for the whole building project. The minimum energy cost savings percentage for each point threshold is as follows:

New Buildings	Existing Building Renovations	Points
12%	8%	1
14%	10%	2
16%	12%	3
18%	14%	4
20%	16%	5
22%	18%	6
24%	20%	7
26%	22%	8
28%	24%	9
30%	26%	10
32%	28%	11
34%	30%	12
36%	32%	13
38%	34%	14
40%	36%	15
42%	38%	16
44%	40%	17
46%	42%	18
48%	44%	19

We think our design will test in this range. Energy modeling occurs in the next design phase

1 Project teams wishing to use ASHRAE approved addenda for the purposes of this credit may do so at their discretion. Addenda must be applied consistently across all LEED credits.

Let's review the building envelope and primary systems

The code minimums

2009 International Energy Conservation Code

Chapter 3 – General Requirements

301 Climate Zone: Connecticut 5A (Moist)

Chapter 5 – Commercial Energy Efficiency - Note: These are minimums - most assembly designs exceed these requirements.

Table 502.2(1) Building Envelope, Opaque Assemblies:

Roofs, Insulation Entirely Above Deck:	R-20 ci
Walls, Above Grade, Metal Framed:	R-13 + R-7.5 ci
Walls, Below Grade:	R-7.5 ci
Slab-on-Grade Floors (non-residential):	No requirement
Opaque Swinging Doors:	U-0.70
Opaque Roll-Up or Sliding Doors:	U-0.50

Table 502.3 Fenestration:

Framing Other Than Metal:	U-0.35
Metal Curtainwall/Storefront:	U-0.45
Metal Entrance Door:	U-0.80
Other Metal Framed:	U-0.55
SHGC, Projection Factor < 0.25:	0.40
SHGC, Projection Factor >/= 0.25:	No requirement

DELAMAR WEST HARTFORD

BASE INFO

SBA
SMITH BUCKLEY ARCHITECTS
431 PINE ST STE 210 BURLINGTON VT 05401
P 802 540 0323 www.SBAVT.com

Assembly Energy Worksheet

Thermal characteristics of the cavity side of the sheathing (From Cold Climates, P. 139)
In this method, interior finishes, air films & thermal bridging are ignored.

Ts	Temperature of the interior surface of the exterior sheathing
Ti	Temperature of the interior air
delta T	Temperature difference across wall
Rc	Thermal resistance of the cavity
Rs	Thermal resistance of the sheathing
R-total	thermal resistance of the assembly
To	Temperature of the outside air
Ts	Temperature of the interior surface of the exterior sheathing

Delta-T = Ti – To

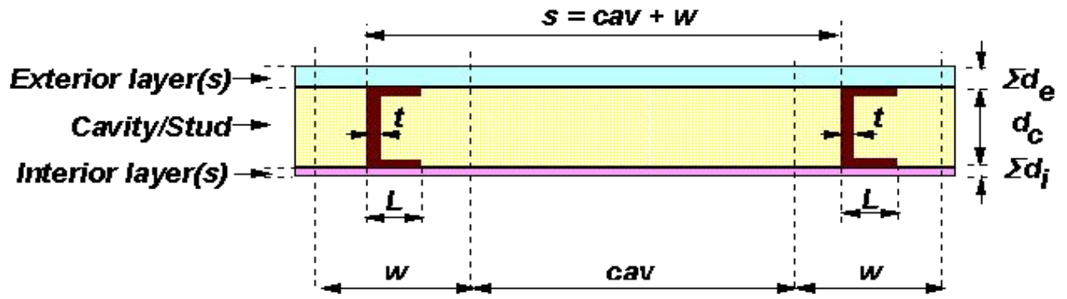
R-Total = Rs + Rc

Ts = Ti – delta-T(Rc/Rtotal)

Component

USING LSTIBUREK ROBUST WALLS SIMPLIFIED APPROACH

MODIFIED ZONE CALCULATION ASSUMPTIONS



LOCATION Hartford, CT

AVERAGE TEMPS

December	29.5
January	24.6
February	27.5

AVERAGE TEMP **27.2** DESIGN TEMP FOR OUTSIDE

AVERAGE MIN. TEMPS

December	21.3
January	15.8
February	18.6

AVERAGE MIN. TEMP **18.56667**

DELAMAR WEST HARTFORD

(CODE BASE) Wall

SBA
SMITH BUCKLEY ARCHITECTS
431 PINE ST STE 210 BURLINGTON VT 05401
P 802 540 0323 www.SBAVT.com

Component	R-Value Total	R-Value Per Inch	inches	WINTER AVERAGE Temperature Differential Delta-T = 42.8		WINTER AVERAGE MIN. Temperature Differential Delta-T = 51.43333333		
				27.2	Outside Air	18.56666667	Outside Air	
Outside Air Film	0.17				0.300847633		0.36153263	
				27.50084763		18.9281993		
Common Brick	0.725	0.2	3.625		1.283026669		1.541830336	
				28.7838743		20.47002963		
Air Space	1.1				1.946661154		2.339328785	
				30.73053546		22.80935842		
Continuous Insulation	7.5	5	1.5		13.27268968		15.94996899	
				44.00322514		38.75932741		
Air Barrier	0				0		0	
				44.00322514		38.75932741		
Dens-Glass ½	0.45			DP	0.796361381		0.956998139	
				44.7996		**39.7163**		<<<< CONDENSING SURFACE
FG Batt (unfaced)	13				23.00599545	DP	27.64661291	
				67.80558197		67.36293846		<<<< VAPOR RETARDER
5/8" GWB	0.56				0.991027496		1.190931018	
				68.79660947		68.55386948		
Indoor Air Film	0.68				1.203390531		1.446130522	
R-total	**24.185**			**70**	**Inside Air**	**70**	**Inside Air**	

CLIMATE ZONE 5

Design Dewpoint
70 DEGREES AT 35% RH = 40 DEGREES DP
70 DEGREES AT 30% RH = 37 DEGREES DP

THIS IS A CODE-MINIMUM THERMAL WALL

THERE IS CONDENSATION RISK

THE INSULATING SHEATHING PARTIALLY WARMS THE THE CONDENSING SURFACE
USE CLASS II VAPOR RETARDER, SUCH AS KRAFT FACING

Modified Zone Method Calculator

CODE BASE CASE WALL SYSTEM

Summary of Wall Properties Used in Calculation

Property		Dimension (in)	Material Resistivity ($h\text{-}ft^2\text{-}F/Btu\text{-}in$)
Interior Finish	Layer 1	$d_{i1} = .625$	.9
	Layer 2	$d_{i2} = 0$	0
Stud	Flange	$L = 1.5$	.003
	Depth	$d_c = 3.5$	
	Thickness	$t = .0478$	
	Spacing	$s = 16$	
Cavity	Insulation	$d_c = 3.5$	3.45
Exterior Finish	Layer 3	$d_{e3} = .5$	.9
	Layer 2	$d_{e2} = 1.5$	5
	Layer 1	$d_{e1} = 3.625$	.21

Average resistivity of first 1 inch of exterior sheathing = 2.95 $h\text{-}ft^2\text{-}F/Btu\text{-}in$
Ratio of sheating resistivity to cavity resistivity = 0.86
Modified zone factor = 1.49
Width of stud influence zone = 9.93 in.

R_{cav} = 21.35 $h\text{-}ft^2\text{-}F/Btu$
R_w = 11.07 $h\text{-}ft^2\text{-}F/Btu$

R_{tot} = 13.55 $h\text{-}ft^2\text{-}F/Btu$ WHOLE WALL R-VALUE

DELAMAR WEST HARTFORD

DWH - Stone Veneer Wall

SBA
SMITH BUCKLEY ARCHITECTS
431 PINE ST STE 210 BURLINGTON VT 05401
P 802 540 0323 www.SBAVT.com

Component	R-Value Total	R-Value Per Inch	inches	WINTER AVERAGE Temperature Differential Delta-T = 42.8		WINTER AVERAGE MIN. Temperature Differential Delta-T = 51.43333333	
				27.2	Outside Air	18.56666667	Outside Air
Outside Air Film	0.17				0.31681099		0.380716011
				27.51681099		18.94738268	
Sandstone Veneer	0.286375	0.079	3.625		0.533686749		0.641338515
				28.05049774		19.58872119	
Air Space	1.1				2.049953465		2.463456539
				30.1004512		22.05217773	
Continuous Insulation	19.5	6.5	3	DP	36.34008414	DP	43.67036592
				66.44053535		65.72254365	
Air Barrier	0				0		0
				66.44053535		65.72254365	
Dens-Glass 5/8	0.67				1.248608019		1.500468983
				67.6891		**67.223**	<<<< CONDENSING SURFACE
	0				0		0
				67.68914337		67.22301263	
5/8" GWB	0.56				1.043612673		1.254123329
				68.73275604		68.47713596	
Indoor Air Film	0.68				1.26724396		1.522864042
R-total	**22.966375**			**70**	**Inside Air**	**70**	**Inside Air**

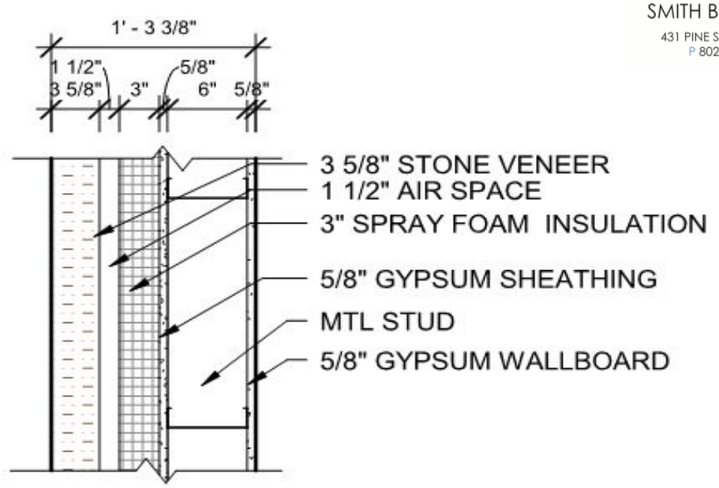
CLIMATE ZONE 5

Design Dewpoint
70 DEGREES AT 35% RH = 40 DEGREES DP
70 DEGREES AT 30% RH = 37 DEGREES DP

THIS WALL'S "WHOLE-WALL" R-VALUE IS 80% +/- BETTER THAN CODE

THERE IS REDUCED CONDENSATION RISK COMPARED TO THE CODE MIN WALL

THE INSULATING SHEATHING SUFFICUENTLY WARMS THE THE CONDENSING SURFACE
THE ASSEMBLY DOES NOT REQUIRE A SPECIFIC VAPOR RESISTANCE ON THE INTERIOR



Modified Zone Method Calculator

Summary of Wall Properties Used in Calculation

Property		Dimension (in)	Material Resistivity (h-ft^2-F/Btu-in)
Interior Finish	Layer 1	$d_{i1} = .625$	.9
	Layer 2	$d_{i2} = 0$	0
Stud	Flange	$L = 1.5$	.003
	Depth	$d_c = 6$	
	Thickness	$t = .0478$	
	Spacing	$s = 16$	
Cavity	Insulation	$d_c = 6$	3.45
Exterior Finish	Layer 3	$d_{e3} = .625$	.9
	Layer 2	$d_{e2} = 3$	6.5
	Layer 1	$d_{e1} = 3.625$	.079

Average resistivity of first 1 inch of exterior sheathing = 3 h-ft^2-F/Btu-in
Ratio of sheating resistivity to cavity resistivity = 0.87
Modified zone factor = 2.04
Width of stud influence zone = 16.36 in.

R_{cav} = 41.61 h-ft^2-F/Btu
R_w = 25.59 h-ft^2-F/Btu

R_{tot} = 25.37 h-ft^2-F/Btu

DELAMAR WEST HARTFORD

DWH - Precast Wall

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SMITH BUCKLEY ARCHITECTS
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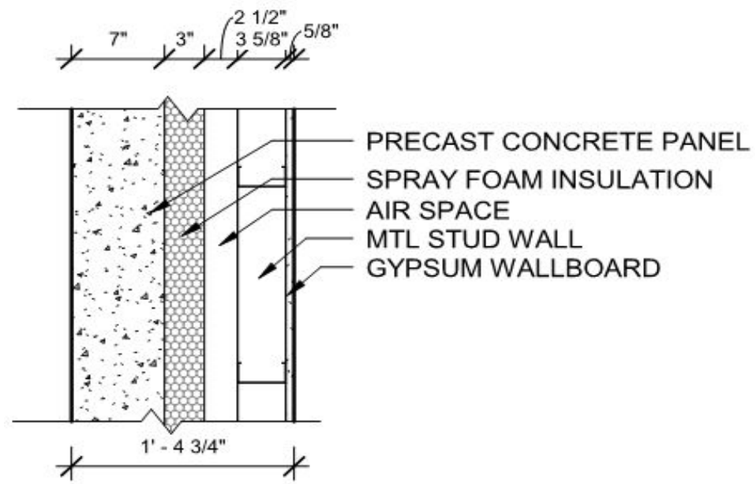
Component	R-Value Total	R-Value Per Inch	inches	WINTER AVERAGE Temperature Differential Delta-T = 42.8 27.2		WINTER AVERAGE MIN. Temperature Differential Delta-T = 51.43333333 18.56666667	
					Outside Air		Outside Air
Outside Air Film	0.17				0.328635953		0.394926227
				27.52863595		18.96159289	
Precast Concrete	0.56	0.08	7		1.082565492		1.300933454
				28.61120145		20.26252635	
	0				0		0
				28.61120145		20.26252635	
Continuous Insulation & AVB	19.5	6.5	3	DP	37.69647696	DP	45.30036134
				66.30767841		65.56288768	
	0				0		0
				66.30767841		65.56288768	
Dens-Glass 5/8	0.67				1.295212285		1.556473954
				67.6029		**67.1194**	
	0				0		0
				67.6028907		67.11936164	
5/8” GWB	0.56				1.082565492		1.300933454
				68.68545619		68.42029509	
Indoor Air Film	0.68				1.314543812		1.579704908
R-total	**22.14**			70	Inside Air	70	Inside Air

<<<< CONDENSING SURFACE



CLIMATE ZONE 5

Design Dewpoint
70 DEGREES AT 35% RH = 40 DEGREES DP
70 DEGREES AT 30% RH = 37 DEGREES DP

THIS WALL'S “WHOLE-WALL” R-VALUE IS 60% +/- BETTER THAN CODE

THERE IS REDUCED CONDENSATION RISK COMPARED TO THE CODE MIN WALL

THE INSULATING SHEATHING SUFFICUENTLY WARMS THE THE CONDENSING SURFACE
THE ASSEMBLY DOES NOT REQUIRE A SPECIFIC VAPOR RESISTANCE ON THE INTERIOR

DELAMAR WEST HARTFORD

(CODE BASE) Flat ROOF SYSTEM

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SMITH BUCKLEY ARCHITECTS
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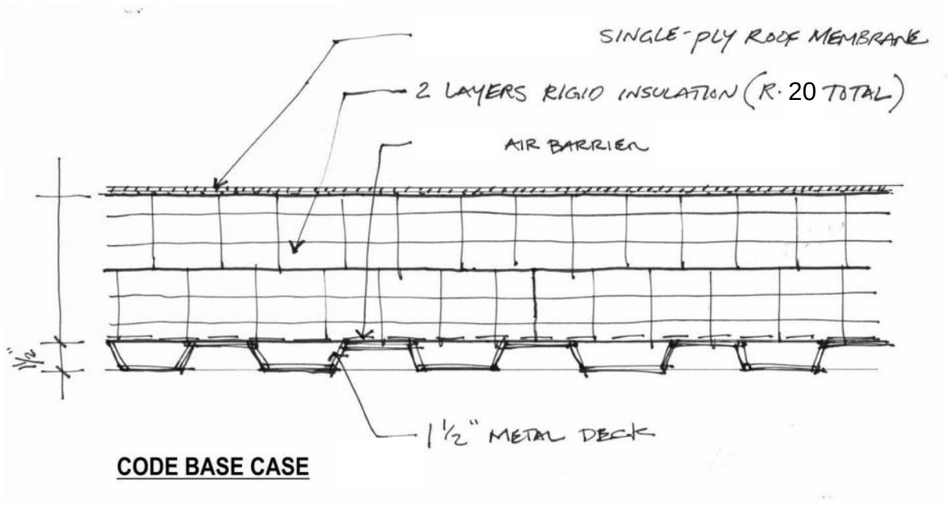
Component	R-Value Total	R-Value Per Inch	inches	WINTER AVERAGE Temperature Differential Delta-T = 42.8 27.2		WINTER AVERAGE MIN. Temperature Differential Delta-T = 51.43333333 18.56666667	
Outside Air Film	0.17				0.348868431		0.419239867
				27.54886843		18.98590653	
--	0	0	0		0		0
				27.54886843		18.98590653	
Roof Membrane	0				0		0
				27.54886843		18.98590653	
Continuous Insulation	20			DP	41.04334484	DP	49.3223373
				68.59221327		68.30824383	
Air Barrier	0				0		0
				68.59221327		68.30824383	
Roof Deck	0.003		0.03		0.006156502		0.007398351
				68.5984		**68.3156**	
--	0		0		0		0
				68.59836977		68.31564218	
--	0.003		0		0.006156502		0.007398351
				68.60452628		68.32304053	
Indoor Air Film	0.68				1.395473725		1.676959468
R-total	**20.856**			**70**	**Inside Air**	**70**	**Inside Air**

<<<< **CONDENSING SURFACE**



CODE BASE CASE

CLIMATE ZONE 5

Design Dewpoint
70 DEGREES AT 35% RH = 40 DEGREES DP
70 DEGREES AT 30% RH = 37 DEGREES DP

THE INSULATING SHEATHING SUFFICUENTLY WARMS THE THE CONDENSING SURFACE
THE ASSEMBLY DOES NOT REQUIRE A SPECIFIC VAPOR RESISTANCE ON THE INTERIOR

DELAMAR WEST HARTFORD

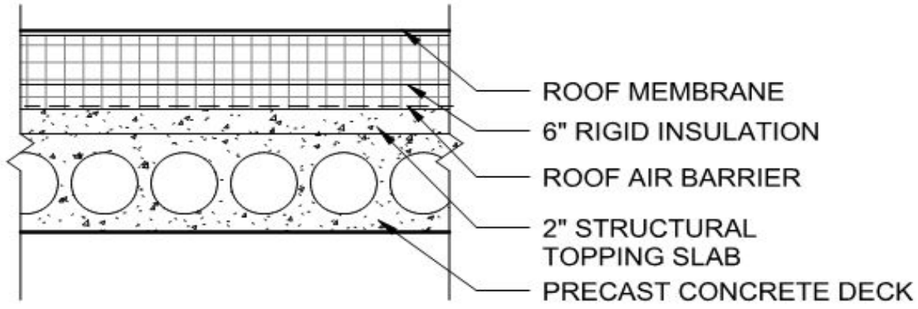
DWH Flat ROOF SYSTEM -

Component	R-Value Total	R-Value Per Inch	inches	WINTER AVERAGE Temperature Differential Delta-T = 42.8 27.2		WINTER AVERAGE MIN. Temperature Differential Delta-T = 51.43333333 18.56666667	
Outside Air Film	0.17				0.187496779		0.225317391
				27.38749678		18.79198406	
--	0	0	0		0		0
				27.38749678		18.79198406	
Roof Membrane	0				0		0
				27.38749678		18.79198406	
Continuous Insulation	37.5	6.25	6	DP	41.35958357	DP	49.70236561
(2 LAYERS 3” RIGID POLYISO)				68.74708035		68.49434967	
Air Barrier	0				0		0
				68.74708035		68.49434967	
1/2” Dens Deck	0.45		0		0.496315003		0.596428387
				69.2434		**69.0908**	<<<< **CONDENSING SURFACE**
Metal Deck	0.003		0.03		0.003308767		0.003976189
				69.24670412		69.09475425	
--	0.003		0		0.003308767		0.003976189
				69.25001288		69.09873044	
Indoor Air Film	0.68				0.749987115		0.901269563
R-total	**38.806**			**70**	**Inside Air**	**70**	**Inside Air**

CLIMATE ZONE 5

Design Dewpoint
70 DEGREES AT 35% RH = 40 DEGREES DP
70 DEGREES AT 30% RH = 37 DEGREES DP

THIS ROOF R-VALUE IS 86% BETTER THAN CODE



THE INSULATING SHEATHING SUFFICUENTLY WARMS THE THE CONDENSING SURFACE
THE ASSEMBLY DOES NOT REQUIRE A SPECIFIC VAPOR RESISTANCE ON THE INTERIOR

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Yes

EA Credit 2: On-site Renewable Energy

1–7 Points

The pergola-mounted PV system is decided upon. The credit depends upon overall building energy use

Intent

To encourage and recognize increasing levels of on-site renewable energy self-supply to reduce environmental and economic impacts associated with fossil fuel energy use.

Requirements

Use on-site renewable energy systems to offset building energy costs. Calculate project performance by expressing the energy produced by the renewable systems as a percentage of the building's annual energy cost and use the table below to determine the number of points achieved.

Use the building annual energy cost calculated in EA Credit 1: Optimize Energy Performance or the U.S. Department of Energy's Commercial Buildings Energy Consumption Survey database to determine the estimated electricity use.

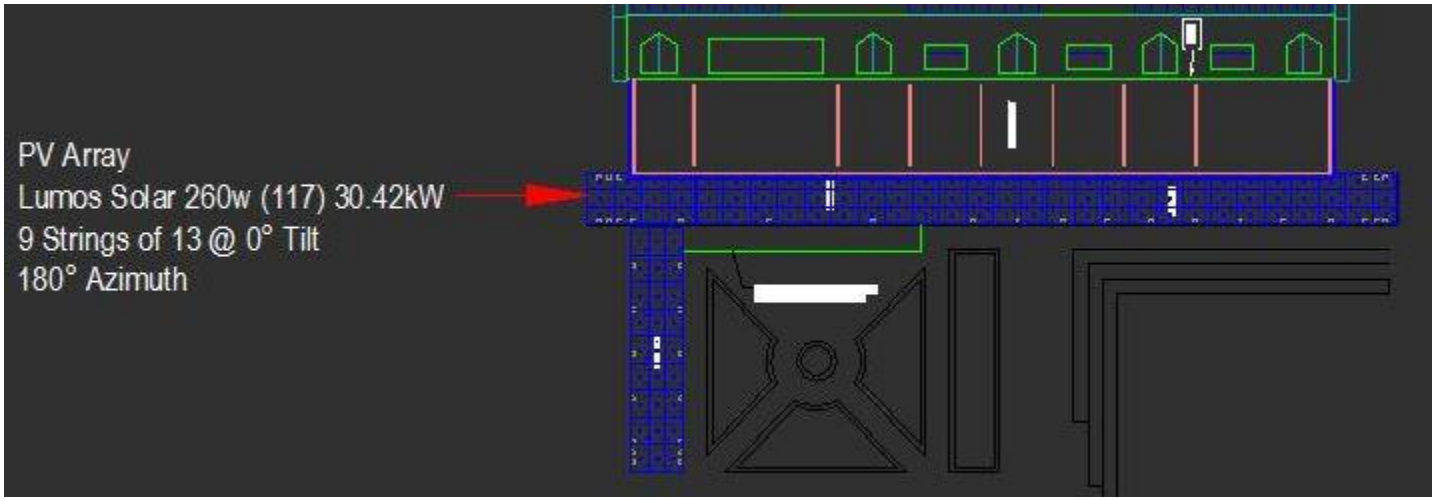
The minimum renewable energy percentage for each point threshold is as follows:

Percentage Renewable Energy	Points
1%	1
3%	2
5%	3
7%	4
9%	5
11%	6
13%	7

Energy modeling in the next phase will yield a % result

Potential Technologies & Strategies

Assess the project for nonpolluting and renewable energy potential including solar, wind, geothermal, low-impact hydro, biomass and bio-gas strategies. When applying these strategies, take advantage of net metering with the local utility.



Maybe

EA Credit 3: Enhanced Commissioning

2 Points

This credit is under consideration

Intent

To begin the commissioning process early in the design process and execute additional activities after systems performance verification is completed.

Requirements

Implement, or have a contract in place to implement, the following additional commissioning process activities in addition to the requirements of EA Prerequisite 1: Fundamental Commissioning of Building Energy Systems and in accordance with the LEED Reference Guide for Green Building Design and Construction, 2009 Edition:

- Prior to the start of the construction documents phase, designate an independent commissioning authority (CxA) to lead, review and oversee the completion of all commissioning process activities.
  - The CxA must have documented commissioning authority experience in at least 2 building projects.
  - The individual serving as the CxA:
    - Must be independent of the work of design and construction.
    - Must not be an employee of the design firm, though he or she may be contracted through them.
    - Must not be an employee of, or contracted through, a contractor or construction manager holding construction contracts.
    - May be a qualified employee or consultant of the owner.
  - The CxA must report results, findings and recommendations directly to the owner.
- The CxA must conduct, at a minimum, 1 commissioning design review of the owner's project requirements basis of design, and design documents prior to the mid-construction documents phase and back-check the review comments in the subsequent design submission.
- The CxA must review contractor submittals applicable to systems being commissioned for compliance with the owner's project requirements and basis of design. This review must be concurrent with the review of the architect or engineer of record and submitted to the design team and the owner.
- The CxA or other project team members must develop a systems manual that gives future operating staff the information needed to understand and optimally operate the commissioned systems.
- The CxA or other project team members must verify that the requirements for training operating personnel and building occupants have been completed.
- The CxA must be involved in reviewing the operation of the building with operations and maintenance (O&M) staff and occupants within 10 months after substantial completion. A plan for resolving outstanding commissioning-related issues must be included.

Yes

EA Credit 4: Enhanced Refrigerant Management

2 Points

Mechanical designer confirmed.

Intent

To reduce ozone depletion and support early compliance with the Montreal Protocol while minimizing direct contributions to climate change.

Requirements

OPTION 1

Do not use refrigerants.

OR

OPTION 2

Select refrigerants and heating, ventilation, air conditioning and refrigeration (HVAC&R) equipment that minimize or eliminate the emission of compounds that contribute to ozone depletion and climate change. The base building HVAC&R equipment must comply with the following formula, which sets a maximum threshold for the combined contributions to ozone depletion and global warming potential:

$$LCGWP + LCODP \times 10^5 \leq 100$$

Calculation definitions for $LCGWP + LCODP \times 10^5 \leq 100$
LCODP = [ODPr x (Lr x Life +Mr) x Rc]/Life
LCGWP = [GWPr x (Lr x Life +Mr) x Rc]/Life
LCODP: Lifecycle Ozone Depletion Potential (lb CFC 11/Ton-Year)
LCGWP: Lifecycle Direct Global Warming Potential (lb CO_2/Ton-Year)
GWPr: Global Warming Potential of Refrigerant (0 to 12,000 lb CO_2/lbr)
ODPr: Ozone Depletion Potential of Refrigerant (0 to 0.2 lb CFC 11/lbr)
Lr: Refrigerant Leakage Rate (0.5% to 2.0%; default of 2% unless otherwise demonstrated)
Mr: End-of-life Refrigerant Loss (2% to 10%; default of 10% unless otherwise demonstrated)
Rc: Refrigerant Charge (0.5 to 5.0 lbs of refrigerant per ton of gross ARI rated cooling capacity)
Life: Equipment Life (10 years; default based on equipment type, unless otherwise demonstrated)

For multiple types of equipment, a weighted average of all base building HVAC&R equipment must be calculated using the following formula:

$$\frac{\Sigma \left(LCGWP + LCODP \times 10^5 \right) \times Qunit}{Qtotal} \leq 100$$

Maybe

EA Credit 5: Measurement and Verification

3 Points This depends upon building metering and controls schemes. EE suggests there may be precedent for 1 point option.

Intent

To provide for the ongoing accountability of building energy consumption over time.

Requirements

OPTION 1

Develop and implement a measurement and verification (M&V) plan consistent with Option D: Calibrated Simulation (Savings Estimation Method 2) as specified in the International Performance Measurement & Verification Protocol (IPMVP) Volume III: Concepts and Options for Determining Energy Savings in New Construction, April 2003.

The M&V period must cover at least 1 year of post-construction occupancy.

Provide a process for corrective action if the results of the M&V plan indicate that energy savings are not being achieved.

OR

OPTION 2

Develop and implement a measurement and verification (M&V) plan consistent with Option B: Energy Conservation Measure Isolation, as specified in the International Performance Measurement & Verification Protocol (IPMVP) Volume III: Concepts and Options for Determining Energy Savings in New Construction, April 2003.

The M&V period must cover at least 1 year of post-construction occupancy.

Provide a process for corrective action if the results of the M&V plan indicate that energy savings are not being achieved.

Potential Technologies & Strategies

Develop an M&V plan to evaluate building and/or energy system performance. Characterize the building and/or energy systems through energy simulation or engineering analysis. Install the necessary metering equipment to measure energy use. Track performance by comparing predicted performance to actual performance, broken down by component or system as appropriate. Evaluate energy efficiency by comparing actual performance to baseline performance.

While the IPMVP describes specific actions for verifying savings associated with energy conservation measures (ECMs) and strategies, this LEED credit expands upon typical IPMVP M&V objectives. Measurement & verification activities should not necessarily be confined to energy systems where ECMs or energy conservation strategies have been implemented. The IPMVP provides guidance on M&V strategies and their appropriate applications for various situations. These strategies should be used in conjunction with monitoring and trend logging of significant energy systems to provide for the ongoing accountability of building energy performance.

Maybe

EA Credit 6: Green Power

2 Points

If needed...

Intent

To encourage the development and use of grid-source, renewable energy technologies on a net zero pollution basis.

Requirements

Engage in at least a 2-year renewable energy contract to provide at least 35% of the building's electricity from renewable sources, as defined by the Center for Resource Solutions' Green-e Energy product certification requirements.

All purchases of green power shall be based on the quantity of energy consumed, not the cost.

OPTION 1. Determine Baseline Electricity Use

Use the annual electricity consumption from the results of EA Credit 1: Optimize Energy Performance.

OR

OPTION 2. Estimate Baseline Electricity Use

Use the U.S. Department of Energy's Commercial Buildings Energy Consumption Survey database to determine the estimated electricity use.

Potential Technologies & Strategies

Determine the energy needs of the building and investigate opportunities to engage in a green power contract. Green power is derived from solar, wind, geothermal, biomass or low-impact hydro sources. Visit http://www.green-e.org/energy for details about the Green-e Energy program. The green power product purchased to comply with credit requirements need not be Green-e Energy certified. Other sources of green power are eligible if they satisfy the Green-e Energy program's technical requirements. Renewable energy certificates (RECs), tradable renewable certificates (TRCs), green tags and other forms of green power that comply with the technical requirements of the Green-e Energy program may be used to document compliance with this credit.

Yes

MR Prerequisite 1: Storage and Collection of Recyclables

Required

Intent

To facilitate the reduction of waste generated by building occupants that is hauled to and disposed of in landfills.

Requirements

Provide an easily-accessible dedicated area or areas for the collection and storage of materials for recycling for the entire building. Materials must include, at a minimum: paper, corrugated cardboard, glass, plastics and metals.

Potential Technologies & Strategies

Designate an area for recyclable collection and storage that is appropriately sized and located in a convenient area. Identify local waste handlers and buyers for glass, plastic, metals, office paper, newspaper, cardboard and organic wastes. Instruct occupants on recycling procedures. Consider employing cardboard balers, aluminum can crushers, recycling chutes and other waste management strategies to further enhance the recycling program.

Guestrooms will have recycling baskets.
Service rooms at each floor will collect.
Basement receiving area collects from public area receptacles and other BOH.
Recycling dumpster at exterior service area.

Yes

MR Credit 2: Construction Waste Management

1–2 Points

Recent similar projects have achieved 65 - 70 percent. We think 75% is achievable.

Intent

To divert construction and demolition debris from disposal in landfills and incineration facilities. Redirect recyclable recovered resources back to the manufacturing process and reusable materials to appropriate sites.

Requirements

Recycle and/or salvage nonhazardous construction and demolition debris. Develop and implement a construction waste management plan that, at a minimum, identifies the materials to be diverted from disposal and whether the materials will be sorted on-site or comingled. Excavated soil and land-clearing debris do not contribute to this credit. Calculations can be done by weight or volume, but must be consistent throughout. The minimum percentage debris to be recycled or salvaged for each point threshold is as follows:

Recycled or Salvaged	Points
50%	1
75%	2

Potential Technologies & Strategies

Establish goals for diversion from disposal in landfills and incineration facilities and adopt a construction waste management plan to achieve these goals. Consider recycling cardboard, metal, brick, mineral fiber panel, concrete, plastic, clean wood, glass, gypsum wallboard, carpet and insulation. Construction debris processed into a recycled content commodity that has an open market value (e.g., wood derived fuel [WDF], alternative daily cover material, etc.) may be applied to the construction waste calculation. Designate a specific area(s) on the construction site for segregated or comingled collection of recyclable materials, and track recycling efforts throughout the construction process. Identify construction haulers and recyclers to handle the designated materials. Note that diversion may include donation of materials to charitable organizations and salvage of materials on-site.

Yes

MR Credit 4: Recycled Content

1–2 Points Recent similar projects have done better than 20%.

Intent

To increase demand for building products that incorporate recycled content materials, thereby reducing impacts resulting from extraction and processing of virgin materials.

Requirements

Use materials with recycled content[1] such that the sum of postconsumer[2] recycled content plus 1/2 of the preconsumer[3] content constitutes at least 10% or 20%, based on cost, of the total value of the materials in the project. The minimum percentage materials recycled for each point threshold is as follows:

Recycled Content	Points
10%	1
20%	2

The recycled content value of a material assembly is determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.

Mechanical, electrical and plumbing components and specialty items such as elevators cannot be included in this calculation. Include only materials permanently installed in the project. Furniture may be included if it is included consistently in MR Credit 3: Materials Reuse through MR Credit 7: Certified Wood.

Potential Technologies & Strategies

Establish a project goal for recycled content materials, and identify material suppliers that can achieve this goal. During construction, ensure that the specified recycled content materials are installed. Consider a range of environmental, economic and performance attributes when selecting products and materials.

1 Recycled content is defined in accordance with the International Organization of Standards document, ISO 14021 — Environmental labels and declarations — Self-declared environmental claims (Type II environmental labeling).
2 Postconsumer material is defined as waste material generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product, which can no longer be used for its intended purpose.
3 Preconsumer material is defined as material diverted from the waste stream during the manufacturing process. Reutilization of materials (i.e., rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it) is excluded.

Yes

MR Credit 5: Regional Materials

1–2 Points Recent similar projects have done better than 20%.

Intent

To increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the use of indigenous resources and reducing the environmental impacts resulting from transportation.

Requirements

Use building materials or products that have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project site for a minimum of 10% or 20%, based on cost, of the total materials value. If only a fraction of a product or material is extracted, harvested, or recovered and manufactured locally, then only that percentage (by weight) can contribute to the regional value. The minimum percentage regional materials for each point threshold is as follows:

Regional Materials	Points
10%	1
20%	2

Mechanical, electrical and plumbing components and specialty items such as elevators and equipment must not be included in this calculation. Include only materials permanently installed in the project. Furniture may be included if it is included consistently in MR Credit 3: Materials Reuse through MR Credit 7: Certified Wood.

Potential Technologies & Strategies

Establish a project goal for locally sourced materials, and identify materials and material suppliers that can achieve this goal. During construction, ensure that the specified local materials are installed, and quantify the total percentage of local materials installed. Consider a range of environmental, economic and performance attributes when selecting products and materials.

Yes

MR Credit 7: Certified Wood

1 Point

Most of the wood in the project will be in finishes and casework - FSC Certified sources for 50% is achievable

Intent

To encourage environmentally responsible forest management.

Requirements

Use a minimum of 50% (based on cost) of wood-based materials and products that are certified in accordance with the Forest Stewardship Council's principles and criteria, for wood building components. These components include at a minimum, structural framing and general dimensional framing, flooring, sub-flooring, wood doors and finishes.

Include only materials permanently installed in the project. Wood products purchased for temporary use on the project (e.g., formwork, bracing, scaffolding, sidewalk protection, and guard rails) may be included in the calculation at the project team's discretion. If any such materials are included, all such materials must be included in the calculation. If such materials are purchased for use on multiple projects, the applicant may include these materials for only one project, at its discretion. Furniture may be included if it is included consistently in MR Credits 3, Materials Reuse, through MR Credit 7, Certified Wood.

Potential Technologies & Strategies

Establish a project goal for FSC-certified wood products and identify suppliers that can achieve this goal. During construction, ensure that the FSC-certified wood products are installed and quantify the total percentage of FSC-certified wood products installed.

Yes

IEQ Prerequisite 1: Minimum Indoor Air Quality Performance

Required

Mechanical designer confirmed.

Intent

To establish minimum indoor air quality (IAQ) performance to enhance indoor air quality in buildings, thus contributing to the comfort and well-being of the occupants.

Requirements

Meet the minimum requirements of Sections 4 through 7 of ASHRAE Standard 62.1-2007, Ventilation for Acceptable Indoor Air Quality (with errata but without addenda[1]).

AND

CASE 1. Mechanically Ventilated Spaces

Mechanical ventilation systems must be designed using the ventilation rate procedure or the applicable local code, whichever is more stringent.

CASE 2. Naturally Ventilated Spaces

Naturally ventilated buildings must comply with ASHRAE Standard 62.1-2007, Paragraph 5.1 (with errata but without addenda[1]).

Potential Technologies & Strategies

Design ventilation systems to meet or exceed the minimum outdoor air ventilation rates as described in the ASHRAE standard. Balance the impacts of ventilation rates on energy use and indoor air quality to optimize for energy efficiency and occupant comfort. Use the ASHRAE Standard 62.1-2007 Users Manual (with errata but without addenda[1]) for detailed guidance on meeting the referenced requirements.

1 Project teams wishing to use ASHRAE approved addenda for the purposes of this prerequisite may do so at their discretion. Addenda must be applied consistently across all LEED credits.

Yes

IEQ Prerequisite 2: Environmental Tobacco Smoke (ETS) Control

Required

Intent

To prevent or minimize exposure of building occupants, indoor surfaces and ventilation air distribution systems to environmental tobacco smoke (ETS).

Requirements

CASE 1. All Projects

OPTION 1

Prohibit smoking in the building.

Prohibit on-property smoking within 25 feet of entries, outdoor air intakes and operable windows. Provide signage to allow smoking in designated areas, prohibit smoking in designated areas or prohibit smoking on the entire property.

OR

OPTION 2

Prohibit smoking in the building except in designated smoking areas.

Prohibit on-property smoking within 25 feet of entries, outdoor air intakes and operable windows. Provide signage to allow smoking in designated areas, prohibit smoking in designated areas or prohibit smoking on the entire property.

Provide designated smoking rooms designed to contain, capture and remove ETS from the building. At a minimum, the smoking room must be directly exhausted to the outdoors, away from air intakes and building entry paths, with no recirculation of ETS-containing air to nonsmoking areas and enclosed with impermeable deck-to-deck partitions. Operate exhaust sufficient to create a negative pressure differential with the surrounding spaces of at least an average of 5 Pascals (Pa) (0.02 inches of water gauge) and a minimum of 1 Pa (0.004 inches of water gauge) when the doors to the smoking rooms are closed.

Verify performance of the smoking rooms' differential air pressures by conducting 15 minutes of measurement, with a minimum of 1 measurement every 10 seconds, of the differential pressure in the smoking room with respect to each adjacent area and in each adjacent vertical chase with the doors to the smoking room closed. Conduct the testing with each space configured for worst-case conditions of transport of air from the smoking rooms (with closed doors) to adjacent spaces.

CASE 2. Residential and Hospitality Projects Only

Prohibit smoking in all common areas of the building.

Locate any exterior designated smoking areas, including balconies where smoking is permitted, at least 25 feet from entries, outdoor air intakes and operable windows opening to common areas.

Prohibit on-property smoking within 25 feet of entries, outdoor air intakes and operable windows. Provide signage to allow smoking in designated areas, prohibit smoking in designated areas or prohibit smoking on the entire property.

Weather-strip all exterior doors and operable windows in the residential units to minimize leakage from outdoors.

Minimize uncontrolled pathways for ETS transfer between individual residential units by sealing penetrations in walls, ceilings and floors in the residential units and by sealing vertical chases adjacent to the units.

Weather-strip all doors in the residential units leading to common hallways to minimize air leakage into the hallway[1].

Demonstrate acceptable sealing of residential units by a blower door test conducted in accordance with ANSI/ASTM-E779-03, Standard Test Method for Determining Air Leakage Rate By Fan Pressurization.

Use the progressive sampling methodology defined in Chapter 4 (Compliance Through Quality Construction) of the Residential Manual for Compliance with California's 2001 Energy Efficiency Standards (http://www.energy.ca.gov/title24/residential_manual). Residential units must demonstrate less than 1.25 square inches leakage area per 100 square feet of enclosure area (i.e., sum of all wall, ceiling and floor areas).

Potential Technologies & Strategies

Prohibit smoking in commercial buildings or effectively control the ventilation air in smoking rooms. For residential buildings, prohibit smoking in common areas and design building envelope and systems to minimize ETS transfer among dwelling units.

1 If the common hallways are pressurized with respect to the residential units then doors in the residential units leading to the common hallways need not be weather-stripped provided that the positive differential pressure is demonstrated as in Case 1, Option 2 above, considering the residential unit as the smoking room.

Yes

IEQ Credit 1: Outdoor Air Delivery Monitoring

1 Point

Mechanical designer confirmed.

Intent

To provide capacity for ventilation system monitoring to help promote occupant comfort and well-being.

Requirements

Install permanent monitoring systems to ensure that ventilation systems maintain design minimum requirements. Configure all monitoring equipment to generate an alarm when airflow values or carbon dioxide (CO_2) levels vary by 10% or more from the design values via either a building automation system alarm to the building operator or a visual or audible alert to the building occupants

AND

CASE 1. Mechanically Ventilated Spaces

Monitor CO_2 concentrations within all densely occupied spaces (those with a design occupant density of 25 people or more per 1,000 square feet). CO_2 monitors must be between 3 and 6 feet above the floor.

Provide a direct outdoor airflow measurement device capable of measuring the minimum outdoor air intake flow with an accuracy of plus or minus 15% of the design minimum outdoor air rate, as defined by ASHRAE Standard 62.1-2007 (with errata but without addenda[1]) for mechanical ventilation systems where 20% or more of the design supply airflow serves nondensely occupied spaces.

CASE 2. Naturally Ventilated Spaces

Monitor CO_2 concentrations within all naturally ventilated spaces. CO_2 monitors must be between 3 and 6 feet above the floor. One CO_2 sensor may be used to monitor multiple nondensely occupied spaces if the natural ventilation design uses passive stack(s) or other means to induce airflow through those spaces equally and simultaneously without intervention by building occupants.[2]

Potential Technologies & Strategies

Install CO_2 and airflow measurement equipment and feed the information to the heating, ventilating and air conditioning (HVAC) system and/or building automation system (BAS) to trigger corrective action, if applicable. If such automatic controls are not feasible with the building systems, use the measurement equipment to trigger alarms that inform building operators or occupants of a possible deficiency in outdoor air delivery.

1 Project teams wishing to use ASHRAE approved addenda for the purposes of this credit may do so at their discretion. Addenda must be applied consistently across all LEED credits.

2 CO_2 monitoring is required in densely occupied spaces, in addition to outdoor air intake flow measurement.

Yes

IEQ Credit 3.1: Construction Indoor Air Quality Management Plan—During Construction

Mechanical designer confirmed.

1 Point

Intent

To reduce indoor air quality (IAQ) problems resulting from construction or renovation and promote the comfort and well-being of construction workers and building occupants.

Requirements

Develop and implement an IAQ management plan for the construction and preoccupancy phases of the building as follows:

- During construction, meet or exceed the recommended control measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines For Occupied Buildings Under Construction, 2nd Edition 2007, ANSI/SMACNA 008-2008 (Chapter 3).
- Protect stored on-site and installed absorptive materials from moisture damage.
- If permanently installed air handlers are used during construction, filtration media with a minimum efficiency reporting value (MERV) of 8 must be used at each return air grille, as determined by ASHRAE Standard 52.2-1999 (with errata but without addenda[1]). Replace all filtration media immediately prior to occupancy.

Potential Technologies & Strategies

Adopt an IAQ management plan to protect the heating, ventilating and air conditioning (HVAC) system during construction, control pollutant sources and interrupt contamination pathways. Sequence the installation of materials to avoid contamination of absorptive materials, such as insulation, carpeting, ceiling tile and gypsum wallboard. Coordinate with IEQ Credit 3.2: Construction IAQ Management Plan — Before Occupancy and IEQ Credit 5: Indoor Chemical & Pollutant Source Control to determine the appropriate specifications and schedules for filtration media.

If possible, avoid using permanently installed air handlers for temporary heating/cooling during construction. Consult the LEED Reference Guide for Green Building Design and Construction, 2009 Edition for more detailed information on how to ensure the well-being of construction workers and building occupants if permanently installed air handlers must be used during construction.

1 Project teams wishing to use ASHRAE approved addenda for the purposes of this credit may do so at their discretion. Addenda must be applied consistently across all LEED credits.

Yes

IEQ Credit 3.2: Construction Indoor Air Quality Management Plan—Before Occupancy

Mechanical designer confirmed.

1 Point

Intent

To reduce indoor air quality (IAQ) problems resulting from construction or renovation to promote the comfort and well-being of construction workers and building occupants.

Requirements

Develop an IAQ management plan and implement it after all finishes have been installed and the building has been completely cleaned before occupancy.

OPTION 1. Flush-Out[1]

PATH 1

After construction ends, prior to occupancy and with all interior finishes installed, install new filtration media and , perform a building flush-out by supplying a total air volume of 14,000 cubic feet of outdoor air per square foot of floor area while maintaining an internal temperature of at least 60° F and relative humidity no higher than 60%.

OR

PATH 2

If occupancy is desired prior to completion of the flush-out, the space may be occupied following delivery of a minimum of 3,500 cubic feet of outdoor air per square foot of floor area. Once the space is occupied, it must be ventilated at a minimum rate of 0.30 cubic feet per minute (cfm) per square foot of outside air or the design minimum outside air rate determined in IEQ Prerequisite 1: Minimum Indoor Air Quality Performance, whichever is greater. During each day of the flush-out period, ventilation must begin a minimum of 3 hours prior to occupancy and continue during occupancy. These conditions must be maintained until a total of 14,000 cubic feet per square foot of outside air has been delivered to the space.

OR

OPTION 2. Air Testing

Conduct baseline IAQ testing after construction ends and prior to occupancy using testing protocols consistent with the EPA Compendium of Methods for the Determination of Air Pollutants in Indoor Air and as additionally detailed in the LEED Reference Guide for Green Building Design and Construction, 2009 Edition.

1 All finishes must be installed prior to flush-out.

Yes

IEQ Credit 4.1: Low-Emitting Materials—Adhesives and Sealants

1 Point

The products specified are in compliance.

Intent

To reduce the quantity of indoor air contaminants that are odorous, irritating and/or harmful to the comfort and well-being of installers and occupants.

Requirements

All adhesives and sealants used on the interior of the building (i.e., inside of the weatherproofing system and applied on-site) must comply with the following requirements as applicable to the project scope[1]:

- Adhesives, Sealants and Sealant Primers must comply with South Coast Air Quality Management District (SCAQMD) Rule #1168. Volatile organic compound (VOC) limits listed in the table below correspond to an effective date of July 1, 2005 and rule amendment date of January 7, 2005.

Architectural Applications	VOC Limit (g/L less water)	Specialty Applications	VOC Limit (g/L less water)
Indoor carpet adhesives	50	PVC welding	510
Carpet pad adhesives	50	CPVC welding	490
Wood flooring adhesives	100	ABS welding	325
Rubber floor adhesives	60	Plastic cement welding	250
Subfloor adhesives	50	Adhesive primer for plastic	550
Ceramic tile adhesives	65	Contact adhesive	80
VCT and asphalt adhesives	50	Special purpose contact adhesive	250
Drywall and panel adhesives	50	Structural wood member adhesive	140
Cove base adhesives	50	Sheet applied rubber lining operations	850
Multipurpose construction adhesives	70	Top and trim adhesive	250
Structural glazing adhesives	100		
Substrate Specific Applications	**VOC Limit (g/L less water)**	**Sealants**	**VOC Limit (g/L less water)**
Metal to metal	30	Architectural	250
Plastic foams	50	Nonmembrane roof	300
Porous material (except wood)	50	Roadway	250
Wood	30	Single-ply roof membrane	450
Fiberglass	80	Other	420
Sealant Primers	**VOC Limit (g/L less water)**		
Architectural, nonporous	250		
Architectural, porous	775		
Other	750		

1 The use of a VOC budget is permissible for compliance with this credit.

Yes

IEQ Credit 4.2: Low-Emitting Materials—Paints and Coatings

1 Point

The products specified are in compliance.

Intent

To reduce the quantity of indoor air contaminants that are odorous, irritating and/or harmful to the comfort and well-being of installers and occupants.

Requirements

Paints and coatings used on the interior of the building (i.e., inside of the weatherproofing system and applied on-site) must comply with the following criteria as applicable to the project scope[1]:

- Architectural paints and coatings applied to interior walls and ceilings must not exceed the volatile organic compound (VOC) content limits established in Green Seal Standard GS-11, Paints, 1st Edition, May 20, 1993.
- Anti-corrosive and anti-rust paints applied to interior ferrous metal substrates must not exceed the VOC content limit of 250 g/L established in Green Seal Standard GC-03, Anti-Corrosive Paints, 2nd Edition, January 7, 1997.
- Clear wood finishes, floor coatings, stains, primers, and shellacs applied to interior elements mustl not exceed the VOC content limits established in South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings, rules in effect on January 1, 2004.

Potential Technologies & Strategies

Specify low-VOC paints and coatings in construction documents. Ensure that VOC limits are clearly stated in each section of the specifications where paints and coatings are addressed. Track the VOC content of all interior paints and coatings during construction.

1 The use of a VOC budget is permissible for compliance with this credit.

Yes

IEQ Credit 4.3: Low-Emitting Materials—Flooring Systems

1 Point

The products specified are in compliance.

Intent

To reduce the quantity of indoor air contaminants that are odorous, irritating and/or harmful to the comfort and well-being of installers and occupants.

Requirements

OPTION 1

All flooring must comply with the following as applicable to the project scope:

- All carpet installed in the building interior must meet the testing and product requirements of the Carpet and Rug Institute Green Label Plus[1] program.
- All carpet cushion installed in the building interior must meet the requirements of the Carpet and Rug Institute Green Label program.
- All carpet adhesive must meet the requirements of IEQ Credit 4.1: Adhesives and Sealants, which includes a volatile organic compound (VOC) limit of 50 g/L.
- All hard surface flooring must be certified as compliant with the FloorScore[2] standard (current as of the date of this rating system, or more stringent version) by an independent third-party. Flooring products covered by FloorScore include vinyl, linoleum, laminate flooring, wood flooring, ceramic flooring, rubber flooring and wall base.
- An alternative compliance path using FloorScore is acceptable for credit achievement: 100% of the non-carpet finished flooring must be FloorScore-certified and must constitute at least 25% of the finished floor area. Examples of unfinished flooring include floors in mechanical rooms, electrical rooms and elevator service rooms.
- Concrete, wood, bamboo and cork floor finishes such as sealer, stain and finish must meet the requirements of South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings, rules in effect on January 1, 2004.
- Tile setting adhesives and grout must meet South Coast Air Quality Management District (SCAQMD) Rule 1168. VOC limits correspond to an effective date of July 1, 2005 and rule amendment date of January 7, 2005.

1 The Green Label Plus program for carpets and its associated VOC emission criteria in micrograms per square meter per hour, along with information on testing method and sample collection developed by the Carpet & Rug Institute (CRI) in coordination with California's Sustainable Building Task Force and the California Department of Public Health, are described in Section 9, Acceptable Emissions Testing for Carpet, DHS Standard Practice CA/DHS/EHLB/R-174, dated 07/15/04. This document is available at http://www.dhs.ca.gov/ps/deodc/ehlb/iaq/VOCS/Section01350_7_15_2004_FINAL_PLUS_ADDENDUM-2004-01.pdf (also published as Section 01350 Section 9 [dated 2004] by the Collaborative for High Performance Schools [http://www.chps.net]).

2 FloorScore is a voluntary, independent certification program that tests and certifies hard surface flooring and associated products for compliance with criteria adopted in California for indoor air emissions of VOCs with potential health effects. The program uses a small-scale chamber test protocol and incorporates VOC emissions criteria, which are widely known as Section 1350, developed by the California Department of Health Services.

Yes

IEQ Credit 4.4: Low-Emitting Materials—Composite Wood and Agrifiber Products

1 Point

The products specified are in compliance.

Intent

To reduce the quantity of indoor air contaminants that are odorous, irritating and/or harmful to the comfort and well-being of installers and occupants.

Requirements

Composite wood and agrifiber products used on the interior of the building (i.e., inside the weatherproofing system) must contain no added urea-formaldehyde resins. Laminating adhesives used to fabricate on-site and shop-applied composite wood and agrifiber assemblies must not contain added urea-formaldehyde resins.

Composite wood and agrifiber products are defined as particleboard, medium density fiberboard (MDF), plywood, wheatboard, strawboard, panel substrates and door cores. Materials considered fixtures, furniture and equipment (FF&E) are not considered base building elements and are not included.

Potential Technologies & Strategies

Specify wood and agrifiber products that contain no added urea-formaldehyde resins. Specify laminating adhesives for field and shop-applied assemblies that contain no added urea-formaldehyde resins. Review product cut sheets, material safety data (MSD) sheets, signed attestations or other official literature from the manufacturer.

Yes

IEQ Credit 5: Indoor Chemical and Pollutant Source Control

1 Point

Intent

To minimize building occupant exposure to potentially hazardous particulates and chemical pollutants.

Requirements

Design to minimize and control the entry of pollutants into buildings and later cross-contamination of regularly occupied areas through the following strategies:

Entryway systems integrated into the design.

- Employ permanent entryway systems at least 10 feet long in the primary direction of travel to capture dirt and particulates entering the building at regularly used exterior entrances. Acceptable entryway systems include permanently installed grates, grill s and slotted systems that allow for cleaning underneath. Roll-out mats are acceptable only when maintained on a weekly basis by a contracted service organization.

Spaces are exhausted properly.

- Sufficiently exhaust each space where hazardous gases or chemicals may be present or used (e.g., garages, housekeeping and laundry areas, copying and printing rooms) to create negative pressure with respect to adjacent spaces when the doors to the room are closed. For each of these spaces, provide self-closing doors and deck-to-deck partitions or a hard-lid ceiling. The exhaust rate must be at least 0.50 cubic feet per minute (cfm) per square foot with no air recirculation. The pressure differential with the surrounding spaces must be at least 5 Pascals (Pa) (0.02 inches of water gauge) on average and 1 Pa (0.004 inches of water) at a minimum when the doors to the rooms are closed.

MERV 13 filters - Yes

- In mechanically ventilated buildings, install new air filtration media in regularly occupied areas prior to occupancy; these filters must provide a minimum efficiency reporting value (MERV) of 13 or higher. Filtration should be applied to process both return and outside air that is delivered as supply air.

Hazardous storage contained.

- Provide containment (i.e. a closed container for storage for off-site disposal in a regulatory compliant storage area, preferably outside the building) for appropriate disposal of hazardous liquid wastes in places where water and chemical concentrate mixing occurs (e.g., housekeeping, janitorial and science laboratories).

Potential Technologies & Strategies

Design facility cleaning and maintenance areas with isolated exhaust systems for contaminants. Maintain physical isolation from the rest of the regularly occupied areas of the building. Install permanent architectural entryway systems such as grills or grates to prevent occupant-borne contaminants from entering the building. Install high-level filtration systems in air handling units processing both return air and outside supply air. Ensure that air handling units can accommodate required filter sizes and pressure drops.

Yes

IEQ Credit 6.1: Controllability of Systems—Lighting

1 Point

Compliance is practically built-in for hotels

Intent

To provide a high level of lighting system control by individual occupants or groups in multi-occupant spaces (e.g., classrooms and conference areas) and promote their productivity, comfort and well-being.

Requirements

Provide individual lighting controls for 90% (minimum) of the building occupants to enable adjustments to suit individual task needs and preferences

Provide lighting system controls for all shared multi-occupant spaces to enable adjustments that meet group needs and preferences.

Potential Technologies & Strategies

Design the building with occupant controls for lighting. Strategies to consider include lighting controls and task lighting. Integrate lighting systems controllability into the overall lighting design, providing ambient and task lighting while managing the overall energy use of the building.

Yes

IEQ Credit 6.2: Controllability of Systems—Thermal Comfort

1 Point

Mechanical designer confirmed.

Intent

To provide a high level of thermal comfort system control[1] by individual occupants or groups in multi-occupant spaces (e.g., classrooms or conference areas) and promote their productivity, comfort and well-being.

Requirements

Provide individual comfort controls for 50% (minimum) of the building occupants to enable adjustments to meet individual needs and preferences. Operable windows may be used in lieu of controls for occupants located 20 feet inside and 10 feet to either side of the operable part of a window. The areas of operable window must meet the requirements of ASHRAE Standard 62.1-2007 paragraph 5.1 Natural Ventilation (with errata but without addenda[2]).

Provide comfort system controls for all shared multi-occupant spaces to enable adjustments that meet group needs and preferences.

Conditions for thermal comfort are described in ASHRAE Standard 55-2004 (with errata but without addenda[2]) and include the primary factors of air temperature, radiant temperature, air speed and humidity.

Potential Technologies & Strategies

Design the building and systems with comfort controls to allow adjustments to suit individual needs or those of groups in shared spaces. ASHRAE Standard 55-2004 (with errata but without addenda[2]) identifies the factors of thermal comfort and a process for developing comfort criteria for building spaces that suit the needs of the occupants involved in their daily activities. Control strategies can be developed to expand on the comfort criteria and enable individuals to make adjustments to suit their needs and preferences. These strategies may involve system designs incorporating operable windows, hybrid systems integrating operable windows and mechanical systems, or mechanical systems alone. Individual adjustments may involve individual thermostat controls, local diffusers at floor, desk or overhead levels, control of individual radiant panels or other means integrated into the overall building, thermal comfort systems and energy systems design. Designers should evaluate the closely tied interactions between thermal comfort as required by ASHRAE Standard 55-2004 (with errata but without addenda[2]) and acceptable indoor air quality as required by ASHRAE Standard 62.1-2007 (with errata but without addenda[2]), whether natural or mechanical ventilation.

1 For the purposes of this credit, comfort system control is defined as control over at least 1 of the following primary factors in the occupant's vicinity: air temperature, radiant temperature, air speed and humidity.

2 Project teams wishing to use ASHRAE approved addenda for the purposes of this credit may do so at their discretion. Addenda must be applied consistently across all LEED credits.

Yes

IEQ Credit 8.2: Daylight and Views—Views

1 Point **The hotel design easily satisfies these requirements**

Intent

To provide building occupants a connection to the outdoors through the introduction of daylight and views into the regularly occupied areas of the building.

Requirements

Achieve a direct line of sight to the outdoor environment via vision glazing between 30 inches and 90 inches above the finish floor for building occupants in 90% of all regularly occupied areas. Determine the area with a direct line of sight by totaling the regularly occupied square footage that meets the following criteria:

- In plan view, the area is within sight lines drawn from perimeter vision glazing.
- In section view, a direct sight line can be drawn from the area to perimeter vision glazing.

The line of sight may be drawn through interior glazing. For private offices, the entire square footage of the office may be counted if 75% or more of the area has a direct line of sight to perimeter vision glazing. For multi-occupant spaces, the actual square footage with a direct line of sight to perimeter vision glazing is counted.

Potential Technologies & Strategies

Design the space to maximize daylighting and view opportunities. Strategies to consider include lower partitions, interior shading devices, interior glazing and automatic photocell-based controls.

INNOVATION IN DESIGN

Yes

ID Credit 1: Innovation in Design

1–5 Points

We are doing:
- educational
- walkable sites

Intent

To provide design teams and projects the opportunity to achieve exceptional performance above the requirements set by the LEED Green Building Rating System and/or innovative performance in Green Building categories not specifically addressed by the LEED Green Building Rating System.

Requirements

Credit can be achieved through any combination of the Innovation in Design and Exemplary Performance paths as described below:

PATH 1. Innovation in Design (1-5 points)

Achieve significant, measurable environmental performance using a strategy not addressed in the LEED 2009 for New Construction and Major Renovations Rating System.

One point is awarded for each innovation achieved. No more than 5 points under IDc1 may be earned through PATH 1—Innovation in Design.

Identify the following in writing:

- The intent of the proposed innovation credit.
- The proposed requirement for compliance.
- The proposed submittals to demonstrate compliance.
- The design approach (strategies) used to meet the requirements.

PATH 2. Exemplary Performance (1-3 points)

Achieve exemplary performance in an existing LEED 2009 for New Construction and Major Renovations prerequisite or credit that allows exemplary performance as specified in the LEED Reference Guide for Green Building Design & Construction, 2009 Edition. An exemplary performance point may be earned for achieving double the credit requirements and/or achieving the next incremental percentage threshold of an existing credit in LEED.

One point is awarded for each exemplary performance achieved. No more than 3 points under IDc1 may be earned through PATH 2— Exemplary Performance.

Potential Technologies & Strategies

Substantially exceed a LEED 2009 for New Construction and Major Renovations performance credit such as energy performance or water efficiency. Apply strategies or measures that demonstrate a comprehensive approach and quantifiable environment and/or health benefits.

Yes

ID Credit 2: LEED Accredited Professional

1 Point

Intent

To support and encourage the design integration required by LEED to streamline the application and certification process.

Requirements

At least 1 principal participant of the project team shall be a LEED Accredited Professional (AP).

Potential Technologies & Strategies

Educate the project team members about green building design and construction, the LEED requirements and application process early in the life of the project. Consider assigning integrated design and construction process facilitation to the LEED AP.

There are many LEED Accredited professionals on the broader A/E/C team. More than half of our project staff are LEED AP

REGIONAL PRIORITY

RP Credit 1: Regional Priority

1–4 Points

Intent

To provide an incentive for the achievement of credits that address geographically-specific environmental priorities.

Requirements

Earn 1-4 of the 6 Regional Priority credits identified by the USGBC regional councils and chapters as having environmental importance for a project's region. A database of Regional Priority credits and their geographic applicability is available on the USGBC website, http://www.usgbc.org.

One point is awarded for each Regional Priority credit achieved; no more than 4 credits identified as Regional Priority credits may be earned. Projects outside of the U.S. are not eligible for Regional Priority credits.

Potential Technologies & Strategies

Determine and pursue the prioritized credits for the project location.

Credit 1.1 Regional Priority: SSc7.2 Heat Island Effect, Roof - Yes

Credit 1.2 Regional Priority: SSc6.1 Stormwater Design, Quantity Control - Yes

Credit 1.3 Regional Priority: EAc2 Onsite renewable Energy - Yes

Credit 1.4 Regional Priority: SSc7.1 Heat Island Effect, Non-roof - Yes